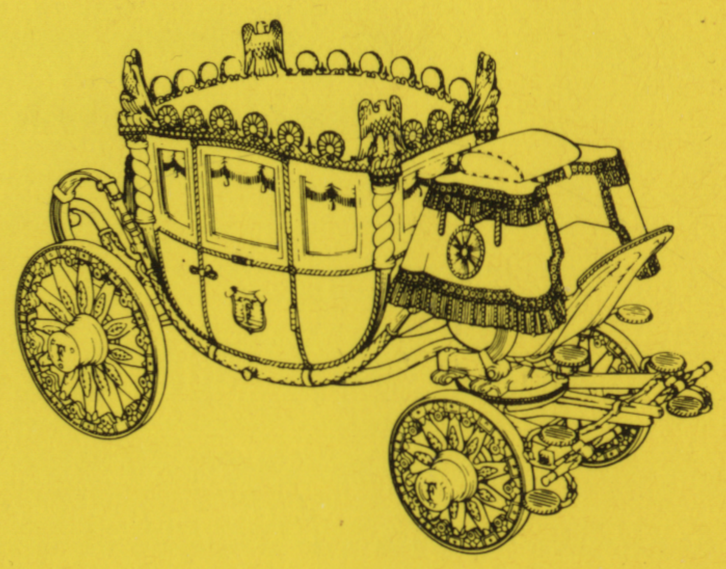
1974
1975

AIR CUSHION RESTRAINT SYSTEM

BUICK
CADILLAC
OLDSMOBILE



SERVICE MANUAL

IMPORTANT SAFETY NOTICE

Proper service and repair is important to the safe, reliable operation of all motor vehicles. The service procedures recommended by General Motors and described in this service manual are effective methods for performing service operations. Some of these service operations require the use of tools specially designed for the purpose. The special tools should be used when and as recommended.

It is important to note the warnings used throughout this manual.

Do not attempt to service any part in this system without following the detailed instructions in this manual.

1974 and 1975 AIR CUSHION RESTRAINT SYSTEM SERVICE MANUAL

This publication contains the essential removal, installation, adjustment and maintenance procedures for servicing all U.S. 1974 and 1975 Oldsmobile, Buick, and Cadillac "B, C & E" Styles equipped with the Air Cushion Restraint System. All information, illustrations, and specifications contained in this publication are based on the latest product information available at the time of publication approval. The right is reserved to make changes at any time without notice.

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6	PARTS DISPOSAL

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FISHER BODY DIVISION
PART NO. 9632394 - A

LITHO IN U. S.A.
AUGUST 1974

MANUAL SERVICE SYSTEM

Cadillac "B", C & E, Styles equipped with the Air Cushion and all U.S. 1974 and 1975 Oldsmobile, Buick, and Chevrolet Models

SECTION	TITLE
1	GENERAL DIAGNOSIS AND OPERATION
2	COMPONENTS INSTRUMENT PANEL
3	BRAKES
4	PASSENGER(S) DOORS AND DRIVER DOORS AND STEERING COLUMN
5	BODY DISPOSAL

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SECTION 1

OPERATION AND DIAGNOSIS

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INTRODUCTION

The Air Cushion Restraint System is designed to deploy for all front seat occupants when involved in a front end accident situation of sufficient force, up to 30 degrees off the centerline of the car. Restraint is provided through the use of inflatable air cushion assemblies, which are deployed to restrain the occupants, when an accident has been sensed by the crash sensing mechanisms.

The complete front occupant Air Cushion Restraint System (Fig. 1-1) consists of the following major components:

1. Driver System
2. Passenger(s) System
3. Sensing Mechanisms
4. Diagnostic System

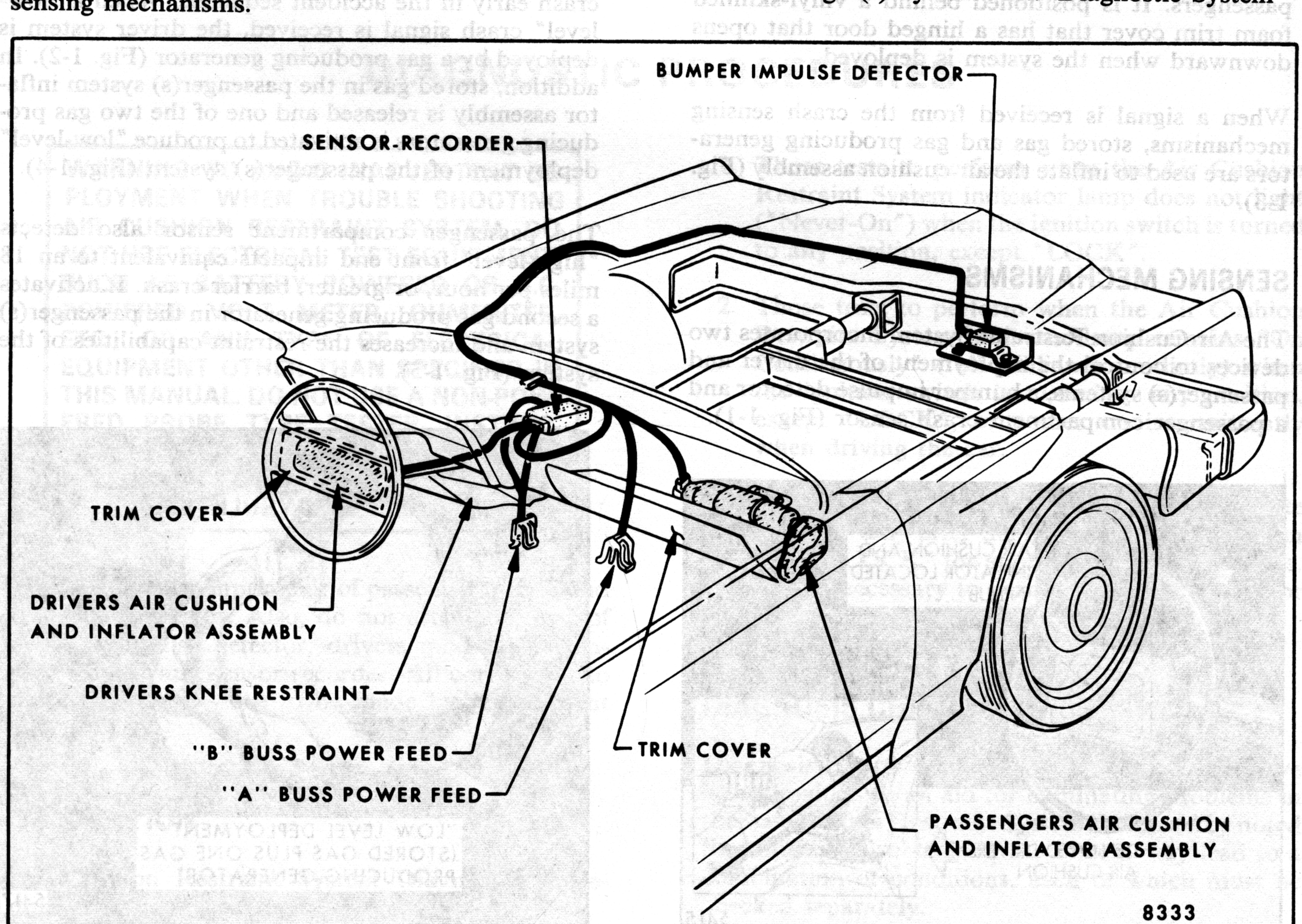

Fig. 1-1-Air Cushion Restraint System

DRIVER SYSTEM

The driver system consists of an air cushion and inflator assembly which is stored in the steering wheel hub area and covered by a vinyl trim cover (Fig. 1-1).

When an accident signal is sensed by the sensing mechanisms, the air cushion is deployed by a gas producing generator that inflates the driver cushion (Fig. 1-2). The trim cover opens at predetermined seams that rupture as the system is deployed.

A knee restraint (energy absorbing pad) and a telescoping steering column complete the driver protection system.

PASSENGER(S) SYSTEM

The passenger(s) system consists of an inflator, air cushions and trim cover. The system is positioned low on the instrument panel and to the right of the centerline of the car (Fig. 1-1). The passenger(s) system provides restraint for the right and center front passengers. It is positioned behind a vinyl-skinned foam trim cover that has a hinged door that opens downward when the system is deployed.

When a signal is received from the crash sensing mechanisms, stored gas and gas producing generators are used to inflate the air cushion assembly (Fig. 1-3).

SENSING MECHANISMS

The Air Cushion Restraint System incorporates two devices to control the deployment of the driver and passenger(s) systems, a bumper impulse detector and a passenger compartment crash sensor (Fig. 1-1).

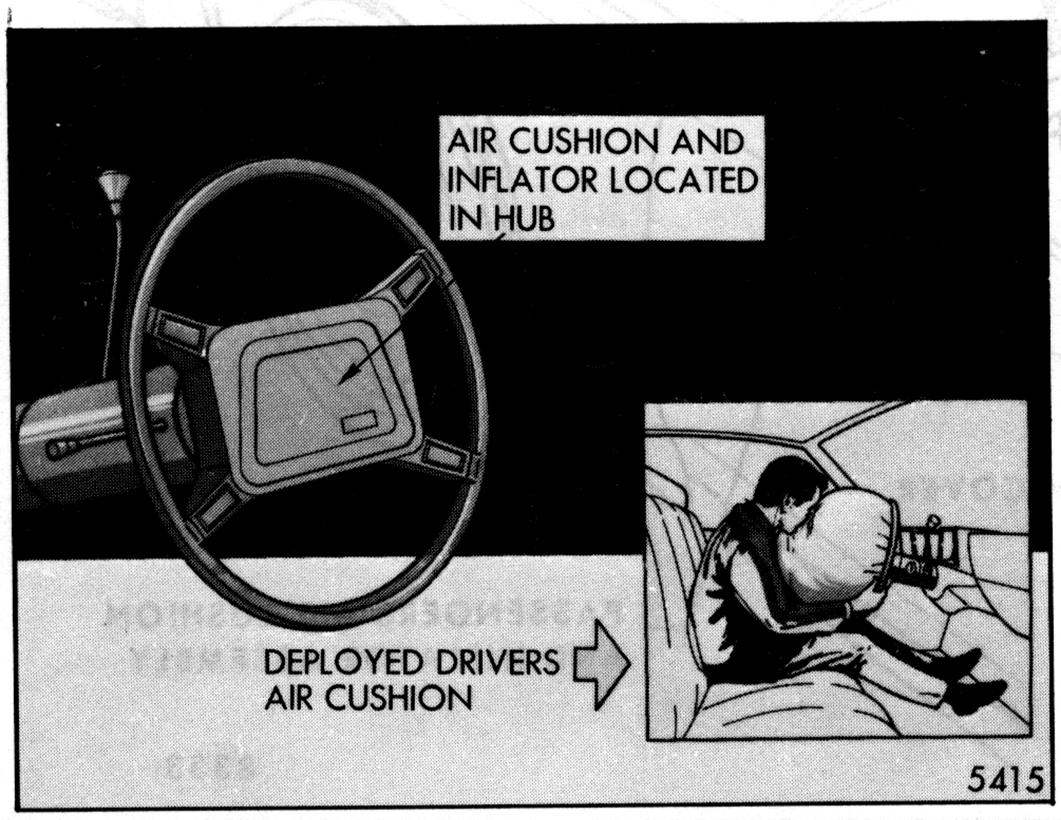

Fig. 1-2-Driver Air Cushion

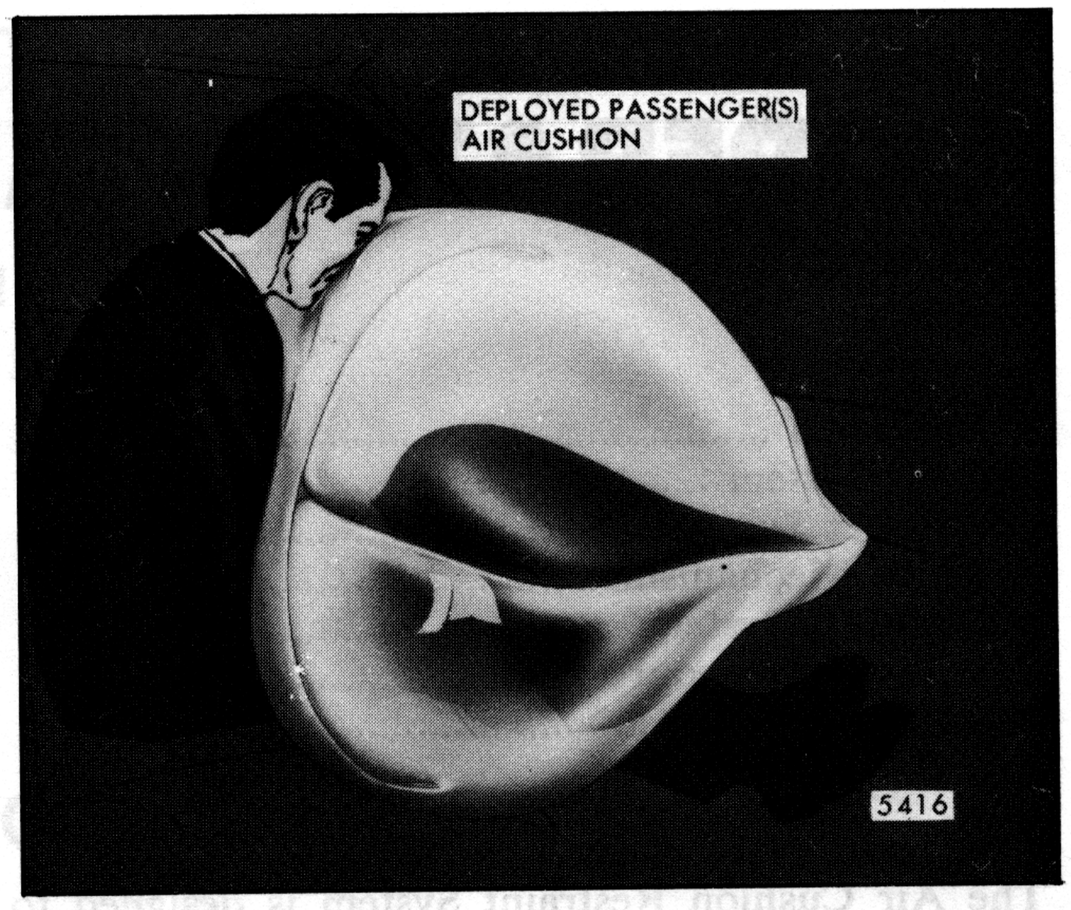

Fig. 1-3-Passenger(s) Air Cushion

The bumper impulse detector and/or passenger compartment sensor detects "low-level" front end impacts equivalent to a 12-18 miles per hour barrier crash early in the accident sequence. When a "low-level" crash signal is received, the driver system is deployed by a gas producing generator (Fig. 1-2). In addition, stored gas in the passenger(s) system inflator assembly is released and one of the two gas producing generators is activated to produce "low-level" deployment of the passenger(s) system (Fig. 1-4).

The passenger compartment sensor also detects "high-level" front end impacts equivalent to an 18 miles per hour, or greater, barrier crash. It activates a second gas producing generator in the passenger(s) system and increases the restraint capabilities of the system (Fig. 1-5).

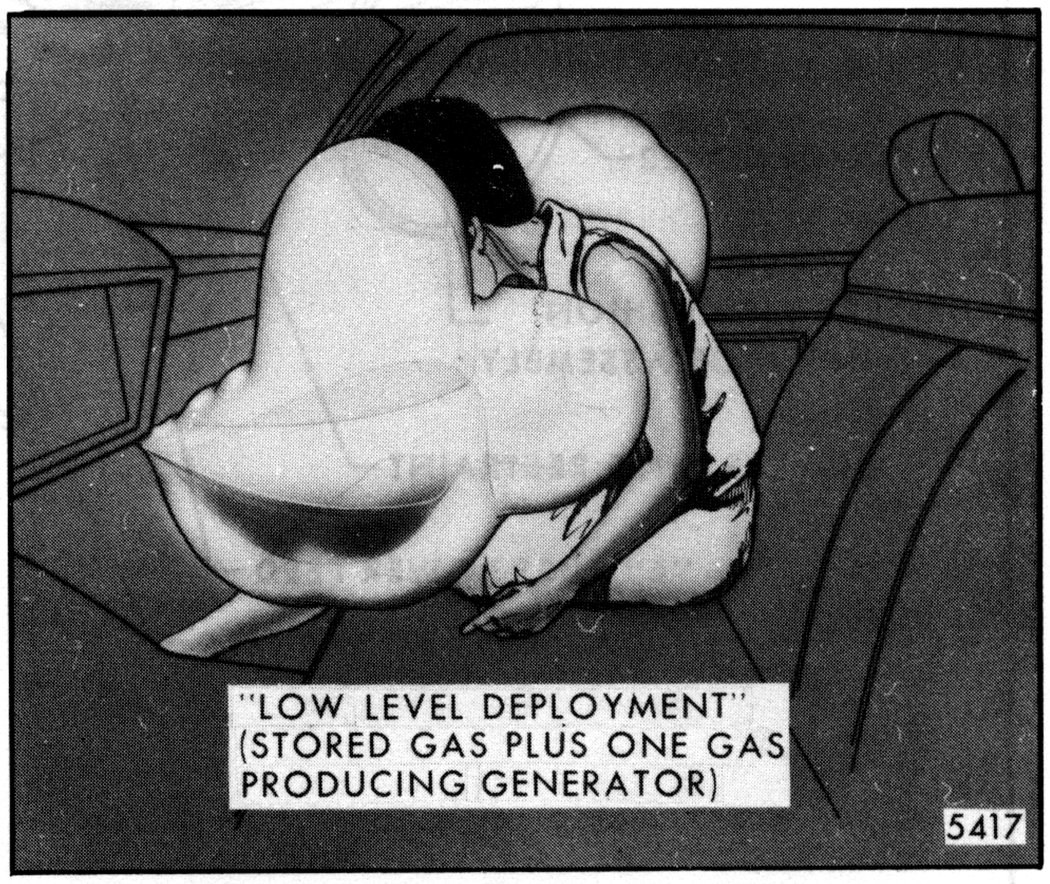

Fig. 1-4-Low Level Deployment

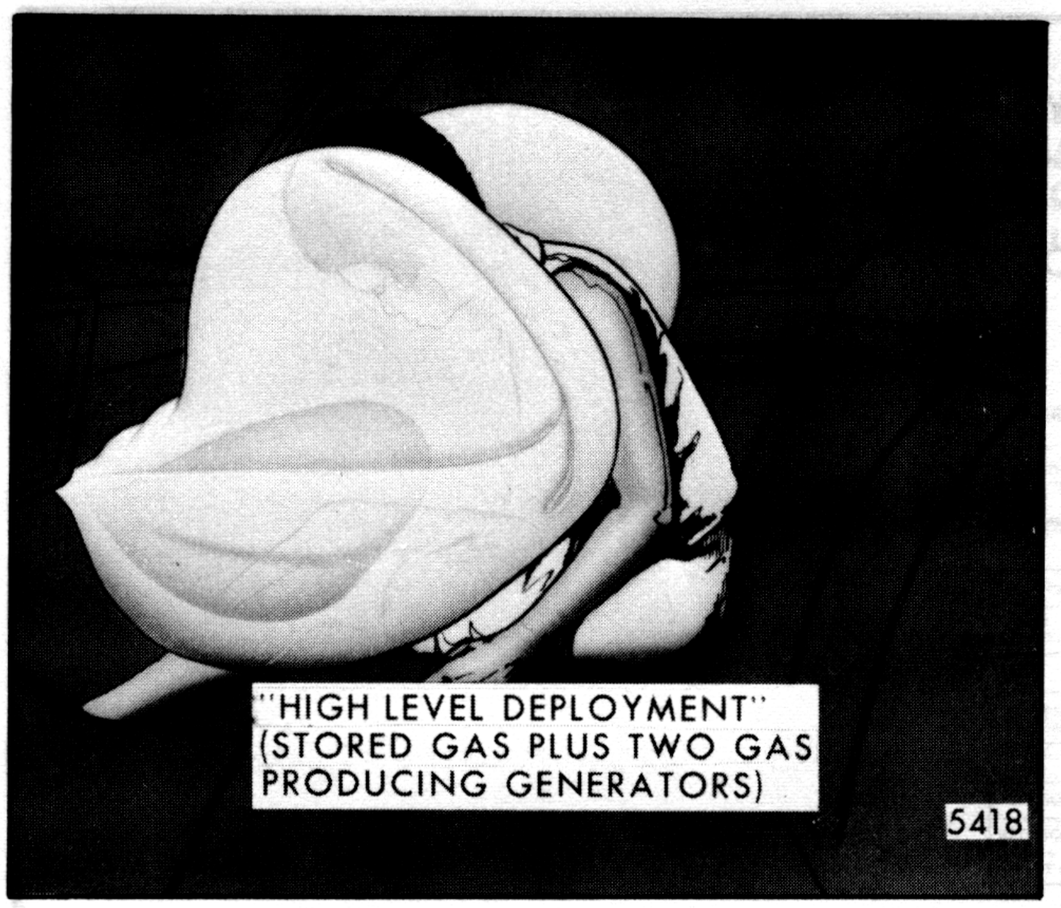

Fig. 1-5-High Level Deployment

DIAGNOSTIC SYSTEM

The complete Air Cushion Restraint System has an integral electronic diagnostic system, which monitors the system's electrical circuits. It indicates to the driver that the system is either operating properly or is in need of immediate service. This is accomplished by an indicator lamp located on the instrument panel that lights when the ignition switch is first turned "ON".

IF THE INDICATOR LAMP DOES NOT LIGHT WHEN THE IGNITION SWITCH IS FIRST TURNED "ON", REMAINS LIGHTED (FULL BRILLIANCE OR DIMLY) AFTER 3-9 SECONDS, OR COMES ON INTERMITTENTLY WHEN DRIVING THE CAR, the system is in need of immediate service.

IF THE INDICATOR LAMP COMES ON WHEN THE IGNITION SWITCH IS FIRST TURNED "ON", AND GOES OUT AFTER 3-9 SECONDS, the system is functioning properly.

DIAGNOSTIC PROCEDURES

WARNING: TO AVOID INADVERTENT DEPLOYMENT WHEN TROUBLE SHOOTING AIR CUSHION RESTRAINT SYSTEM, DO NOT USE ELECTRICAL TEST EQUIPMENT, SUCH AS BATTERY POWERED OR A.C. POWERED VOLT METER, OHMMETER, ETC., OR ANY TYPE OF ELECTRICAL EQUIPMENT OTHER THAN SPECIFIED IN THIS MANUAL. DO NOT USE A NON-POWERED PROBE TYPE TESTER. INSTRUCTIONS IN THIS MANUAL SHOULD BE FOLLOWED CAREFULLY, OTHERWISE PERSONAL INJURY MAY RESULT.

NOTE: Do not attempt repair of passenger, driver and recorder harnesses. Also, do not attempt repair of bumper impulse detector, drivers module, passengers module and sensor recorder. All corrections to these components are to be made by replacement only.

DESCRIPTION

Air Cushion Restraint System Diagnostic Procedures are divided into two categories:

1. Those tests to perform when the Air Cushion Restraint System indicator lamp does not light ("Never-On") when the ignition switch is turned to any position, except "LOCK".

2. Those tests to perform when the Air Cushion Restraint System indicator lamp remains "On Continuously" (full brilliance or dimly) when the ignition switch is turned to any position, except "LOCK", or comes on intermittently when driving the car.

   NOTE: The indicator lamp is designed to operate properly only after the ignition switch has been left in "LOCK" for approximately 150 seconds. This is necessary to permit time for a capacitor discharge within the sensor.

DIAGNOSIS CHARTS

Diagnosis Charts (Figs. 1-6, 1-7, 1-8 and 1-9) have been provided as an aid for eliminating problems in the Air Cushion Restraint System. It should be noted that multiple problems in the system may lead to a combination of conditions, each of which must be checked separately.

AIR CUSHION RESTRAINT SYSTEM INDICATOR LAMP "NEVER-ON" DIAGNOSIS CHART (WHEN "B" BUSS FUSE "OK")

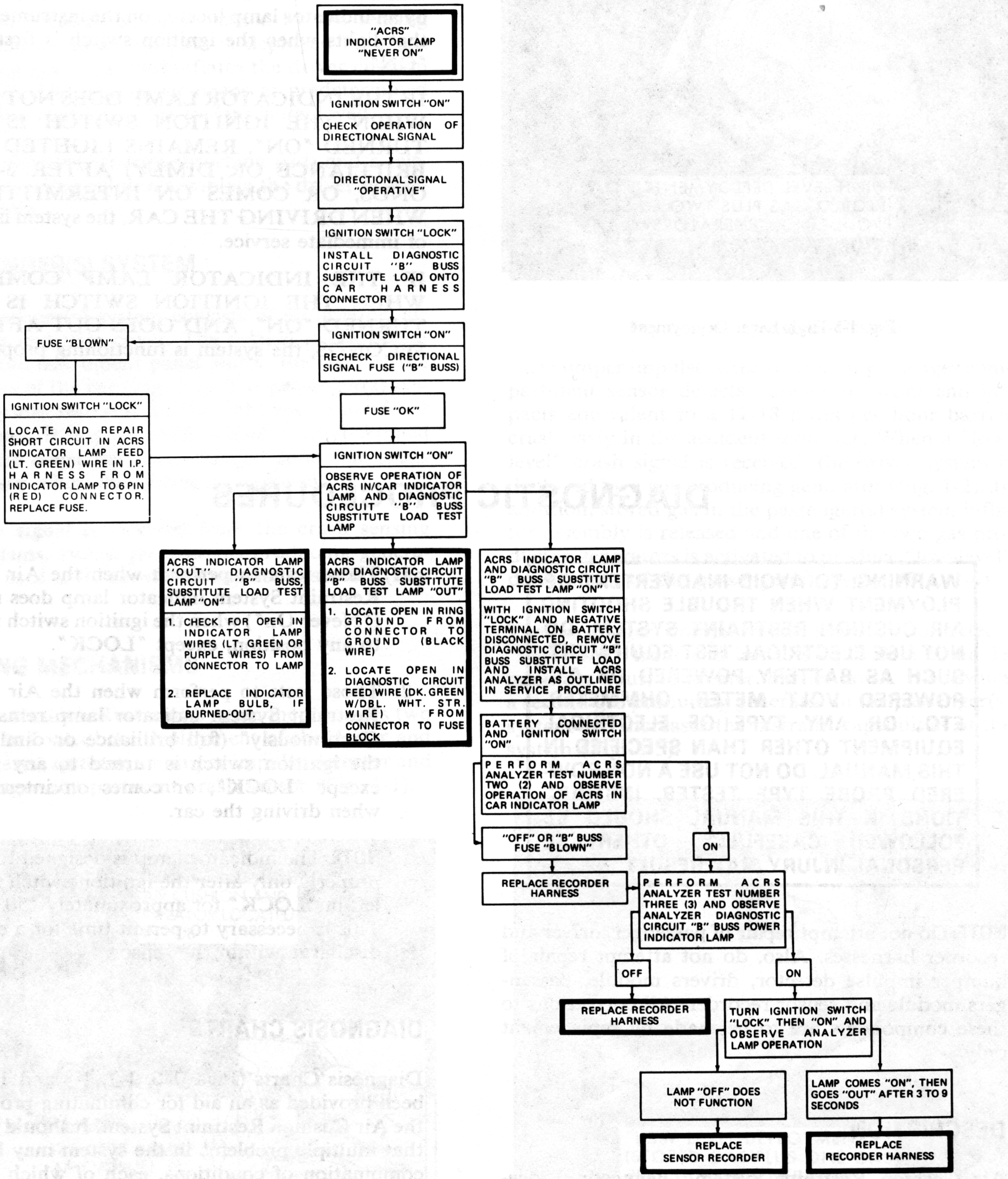
"ACRS" INDICATOR LAMP "NEVER ON"
IGNITION SWITCH "ON"
CHECK OPERATION OF DIRECTIONAL SIGNAL
DIRECTIONAL SIGNAL "OPERATIVE"
IGNITION SWITCH "LOCK"
INSTALL DIAGNOSTIC CIRCUIT "B" BUSS SUBSTITUTE LOAD ONTO CAR HARNESS CONNECTOR
IGNITION SWITCH "ON"
RECHECK DIRECTIONAL SIGNAL FUSE ("B" BUSS)
FUSE "BLOWN"
FUSE "OK"
IGNITION SWITCH "LOCK"
LOCATE AND REPAIR SHORT CIRCUIT IN ACRS INDICATOR LAMP FEED (LT. GREEN) WIRE IN I.P. HARNESS FROM INDICATOR LAMP TO 6 PIN (RED) CONNECTOR. REPLACE FUSE.
IGNITION SWITCH "ON"
OBSERVE OPERATION OF ACRS IN/CAR INDICATOR LAMP AND DIAGNOSTIC CIRCUIT "B" BUSS SUBSTITUTE LOAD TEST LAMP
ACRS INDICATOR LAMP "OUT" DIAGNOSTIC CIRCUIT "B" BUSS, SUBSTITUTE LOAD TEST LAMP "ON"
1. CHECK FOR OPEN IN INDICATOR LAMP WIRES (LT. GREEN OR PURPLE WIRES) FROM CONNECTOR TO LAMP
2. REPLACE INDICATOR LAMP BULB, IF BURNED-OUT.
ACRS INDICATOR LAMP AND DIAGNOSTIC CIRCUIT "B" BUSS SUBSTITUTE LOAD TEST LAMP "OUT"
1. LOCATE OPEN IN RING GROUND FROM CONNECTOR TO GROUND (BLACK WIRE)
2. LOCATE OPEN IN DIAGNOSTIC CIRCUIT FEED WIRE (DK. GREEN W/DBL. WHT. STR. WIRE) FROM CONNECTOR TO FUSE BLOCK
ACRS INDICATOR LAMP AND DIAGNOSTIC CIRCUIT "B" BUSS SUBSTITUTE LOAD TEST LAMP "ON"
WITH IGNITION SWITCH "LOCK" AND NEGATIVE TERMINAL ON BATTERY DISCONNECTED, REMOVE DIAGNOSTIC CIRCUIT "B" BUSS SUBSTITUTE LOAD AND INSTALL ACRS ANALYZER AS OUTLINED IN SERVICE PROCEDURE
BATTERY CONNECTED AND IGNITION SWITCH "ON"
PERFORM ACRS ANALYZER TEST NUMBER TWO (2) AND OBSERVE OPERATION OF ACRS IN CAR INDICATOR LAMP
"OFF" OR "B" BUSS FUSE "BLOWN"
ON
REPLACE RECORDER HARNESS
PERFORM ACRS ANALYZER TEST NUMBER THREE (3) AND OBSERVE ANALYZER DIAGNOSTIC CIRCUIT "B" BUSS POWER INDICATOR LAMP
OFF
ON
REPLACE RECORDER HARNESS
TURN IGNITION SWITCH "LOCK" THEN "ON" AND OBSERVE ANALYZER LAMP OPERATION
LAMP "OFF" DOES NOT FUNCTION
LAMP COMES "ON", THEN GOES "OUT" AFTER 3 TO 9 SECONDS
REPLACE SENSOR RECORDER
REPLACE RECORDER HARNESS
8205

Fig. 1-6-Air Cushion Restraint System Indicator Lamp "Never-On" ("B" Buss Fuse Is OK)

AIR CUSHION RESTRAINT SYSTEM INDICATOR LAMP "NEVER-ON" DIAGNOSIS CHART (WHEN "B" BUSS FUSE "BLOWN")

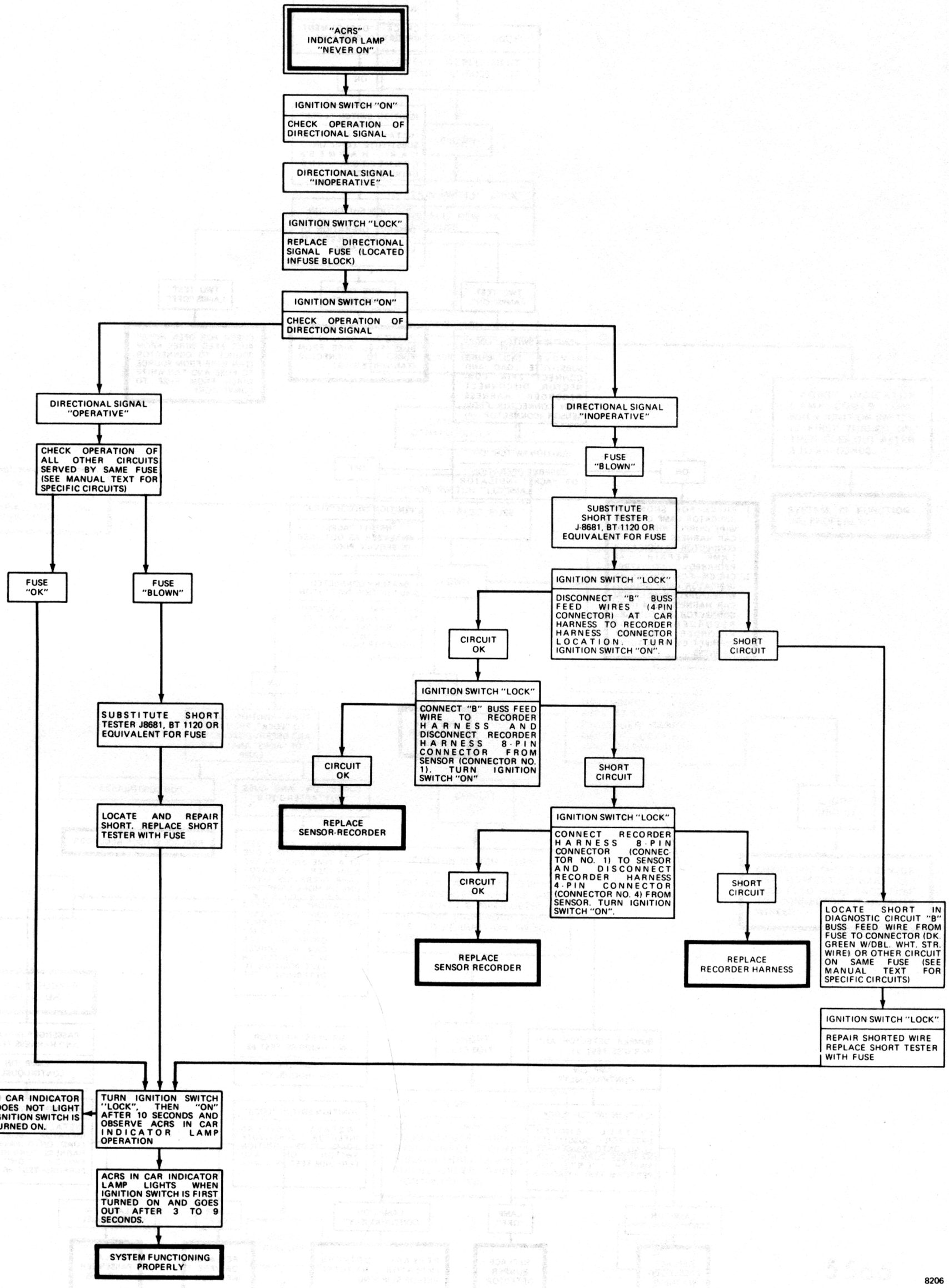
"ACRS" INDICATOR LAMP "NEVER ON"
IGNITION SWITCH "ON"
CHECK OPERATION OF DIRECTIONAL SIGNAL
DIRECTIONAL SIGNAL "INOPERATIVE"
IGNITION SWITCH "LOCK"
REPLACE DIRECTIONAL SIGNAL FUSE (LOCATED INFUSE BLOCK)
IGNITION SWITCH "ON"
CHECK OPERATION OF DIRECTION SIGNAL
DIRECTIONAL SIGNAL "OPERATIVE"
CHECK OPERATION OF ALL OTHER CIRCUITS SERVED BY SAME FUSE (SEE MANUAL TEXT FOR SPECIFIC CIRCUITS)
FUSE "OK"
FUSE "BLOWN"
SUBSTITUTE SHORT TESTER J8681, BT 1120 OR EQUIVALENT FOR FUSE
LOCATE AND REPAIR SHORT. REPLACE SHORT TESTER WITH FUSE
DIRECTIONAL SIGNAL "INOPERATIVE"
FUSE "BLOWN"
SUBSTITUTE SHORT TESTER J-8681, BT-1120 OR EQUIVALENT FOR FUSE
IGNITION SWITCH "LOCK"
DISCONNECT "B" BUSS FEED WIRES (4-PIN CONNECTOR) AT CAR HARNESS TO RECORDER HARNESS CONNECTOR LOCATION. TURN IGNITION SWITCH "ON".
CIRCUIT OK
SHORT CIRCUIT
IGNITION SWITCH "LOCK"
CONNECT "B" BUSS FEED WIRE TO RECORDER HARNESS AND DISCONNECT RECORDER HARNESS 8-PIN CONNECTOR FROM SENSOR (CONNECTOR NO. 1). TURN IGNITION SWITCH "ON"
CIRCUIT OK
REPLACE SENSOR-RECORDER
SHORT CIRCUIT
IGNITION SWITCH "LOCK"
CONNECT RECORDER HARNESS 8-PIN CONNECTOR (CONNECTOR NO. 1) TO SENSOR AND DISCONNECT RECORDER HARNESS 4-PIN CONNECTOR (CONNECTOR NO. 4) FROM SENSOR. TURN IGNITION SWITCH "ON".
CIRCUIT OK
REPLACE SENSOR RECORDER
SHORT CIRCUIT
REPLACE RECORDER HARNESS
LOCATE SHORT IN DIAGNOSTIC CIRCUIT "B" BUSS FEED WIRE FROM FUSE TO CONNECTOR (DK. GREEN W/DBL. WHT. STR. WIRE) OR OTHER CIRCUIT ON SAME FUSE (SEE MANUAL TEXT FOR SPECIFIC CIRCUITS)
IGNITION SWITCH "LOCK"
REPAIR SHORTED WIRE REPLACE SHORT TESTER WITH FUSE
IF DIRECTIONAL SIGNAL ("B" BUSS) FUSE "OK" REFER TO FUSE "OK" DIAGNOSIS CHART.
ACRS IN CAR INDICATOR LAMP DOES NOT LIGHT WHEN IGNITION SWITCH IS FIRST TURNED ON.
TURN IGNITION SWITCH "LOCK", THEN "ON" AFTER 10 SECONDS AND OBSERVE ACRS IN CAR INDICATOR LAMP OPERATION
ACRS IN CAR INDICATOR LAMP LIGHTS WHEN IGNITION SWITCH IS FIRST TURNED ON AND GOES OUT AFTER 3 TO 9 SECONDS.
SYSTEM FUNCTIONING PROPERLY
8206

Fig. 1-7-Air Cushion Restraint System Indicator Lamp "Never-On" ("B" Buss Fuse Is Blown)

AIR CUSHION RESTRAINT SYSTEM INDICATOR LAMP "ON CONTINUOUSLY", DIMLY OR INTERMITTENTLY DIAGNOSIS CHART (WHEN "A" BUSS FUSE "OK")

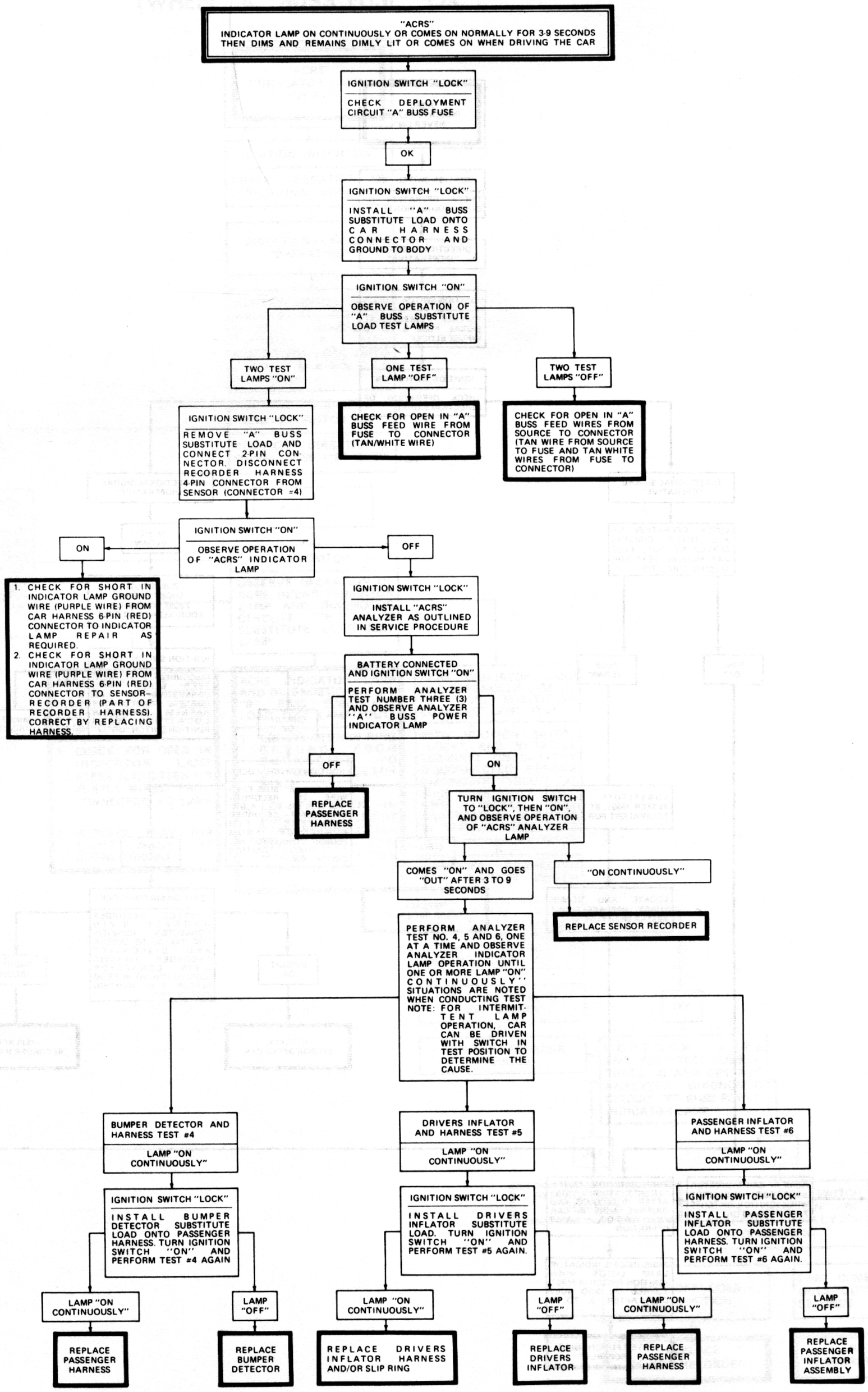
"ACRS" INDICATOR LAMP ON CONTINUOUSLY OR COMES ON NORMALLY FOR 3-9 SECONDS THEN DIMS AND REMAINS DIMLY LIT OR COMES ON WHEN DRIVING THE CAR
IGNITION SWITCH "LOCK"
CHECK DEPLOYMENT CIRCUIT "A" BUSS FUSE
OK
IGNITION SWITCH "LOCK"
INSTALL "A" BUSS SUBSTITUTE LOAD ONTO CAR HARNESS CONNECTOR AND GROUND TO BODY
IGNITION SWITCH "ON"
OBSERVE OPERATION OF "A" BUSS SUBSTITUTE LOAD TEST LAMPS
TWO TEST LAMPS "ON"
ONE TEST LAMP "OFF"
TWO TEST LAMPS "OFF"
IGNITION SWITCH "LOCK"
REMOVE "A" BUSS SUBSTITUTE LOAD AND CONNECT 2-PIN CONNECTOR. DISCONNECT RECORDER HARNESS 4-PIN CONNECTOR FROM SENSOR (CONNECTOR =4)
CHECK FOR OPEN IN "A" BUSS FEED WIRE FROM FUSE TO CONNECTOR (TAN/WHITE WIRE)
CHECK FOR OPEN IN "A" BUSS FEED WIRES FROM SOURCE TO CONNECTOR (TAN WIRE FROM SOURCE TO FUSE AND TAN WHITE WIRES FROM FUSE TO CONNECTOR)
IGNITION SWITCH "ON"
OBSERVE OPERATION OF "ACRS" INDICATOR LAMP
ON
OFF
1. CHECK FOR SHORT IN INDICATOR LAMP GROUND WIRE (PURPLE WIRE) FROM CAR HARNESS 6-PIN (RED) CONNECTOR TO INDICATOR LAMP REPAIR AS REQUIRED.
2. CHECK FOR SHORT IN INDICATOR LAMP GROUND WIRE (PURPLE WIRE) FROM CAR HARNESS 6-PIN (RED) CONNECTOR TO SENSOR-RECORDER (PART OF RECORDER HARNESS). CORRECT BY REPLACING HARNESS.
IGNITION SWITCH "LOCK"
INSTALL "ACRS" ANALYZER AS OUTLINED IN SERVICE PROCEDURE
BATTERY CONNECTED AND IGNITION SWITCH "ON"
PERFORM ANALYZER TEST NUMBER THREE (3) AND OBSERVE ANALYZER "A" BUSS POWER INDICATOR LAMP
OFF
ON
REPLACE PASSENGER HARNESS
TURN IGNITION SWITCH TO "LOCK", THEN "ON", AND OBSERVE OPERATION OF "ACRS" ANALYZER LAMP
COMES "ON" AND GOES "OUT" AFTER 3 TO 9 SECONDS
"ON CONTINUOUSLY"
REPLACE SENSOR RECORDER
PERFORM ANALYZER TEST NO. 4, 5 AND 6, ONE AT A TIME AND OBSERVE ANALYZER INDICATOR LAMP OPERATION UNTIL ONE OR MORE LAMP "ON" CONTINUOUSLY" SITUATIONS ARE NOTED WHEN CONDUCTING TEST NOTE: FOR INTERMITTENT LAMP OPERATION, CAR CAN BE DRIVEN WITH SWITCH IN TEST POSITION TO DETERMINE THE CAUSE.
BUMPER DETECTOR AND HARNESS TEST #4
LAMP "ON CONTINUOUSLY"
DRIVERS INFLATOR AND HARNESS TEST #5
LAMP "ON CONTINUOUSLY"
PASSENGER INFLATOR AND HARNESS TEST #6
LAMP "ON CONTINUOUSLY"
IGNITION SWITCH "LOCK"
INSTALL BUMPER DETECTOR SUBSTITUTE LOAD ONTO PASSENGER HARNESS. TURN IGNITION SWITCH "ON" AND PERFORM TEST #4 AGAIN
IGNITION SWITCH "LOCK"
INSTALL DRIVERS INFLATOR SUBSTITUTE LOAD. TURN IGNITION SWITCH "ON" AND PERFORM TEST #5 AGAIN.
IGNITION SWITCH "LOCK"
INSTALL PASSENGER INFLATOR SUBSTITUTE LOAD ONTO PASSENGER HARNESS. TURN IGNITION SWITCH "ON" AND PERFORM TEST #6 AGAIN.
LAMP "ON CONTINUOUSLY"
LAMP "OFF"
LAMP "ON CONTINUOUSLY"
LAMP "OFF"
LAMP "ON CONTINUOUSLY"
LAMP "OFF"
REPLACE PASSENGER HARNESS
REPLACE BUMPER DETECTOR
REPLACE DRIVERS INFLATOR HARNESS AND/OR SLIP RING
REPLACE DRIVERS INFLATOR
REPLACE PASSENGER HARNESS
REPLACE PASSENGER INFLATOR ASSEMBLY
8207

Fig. 1-8-Air Cushion Restraint System Indicator Lamp "On Continuously, Dimly, Brightly or Intermittently" ("A" Buss Fuse Is OK)

AIR CUSHION RESTRAINT SYSTEM INDICATOR LAMP "ON CONTINUOUSLY" DIAGNOSIS CHART (WHEN "A" BUSS FUSE "BLOWN")

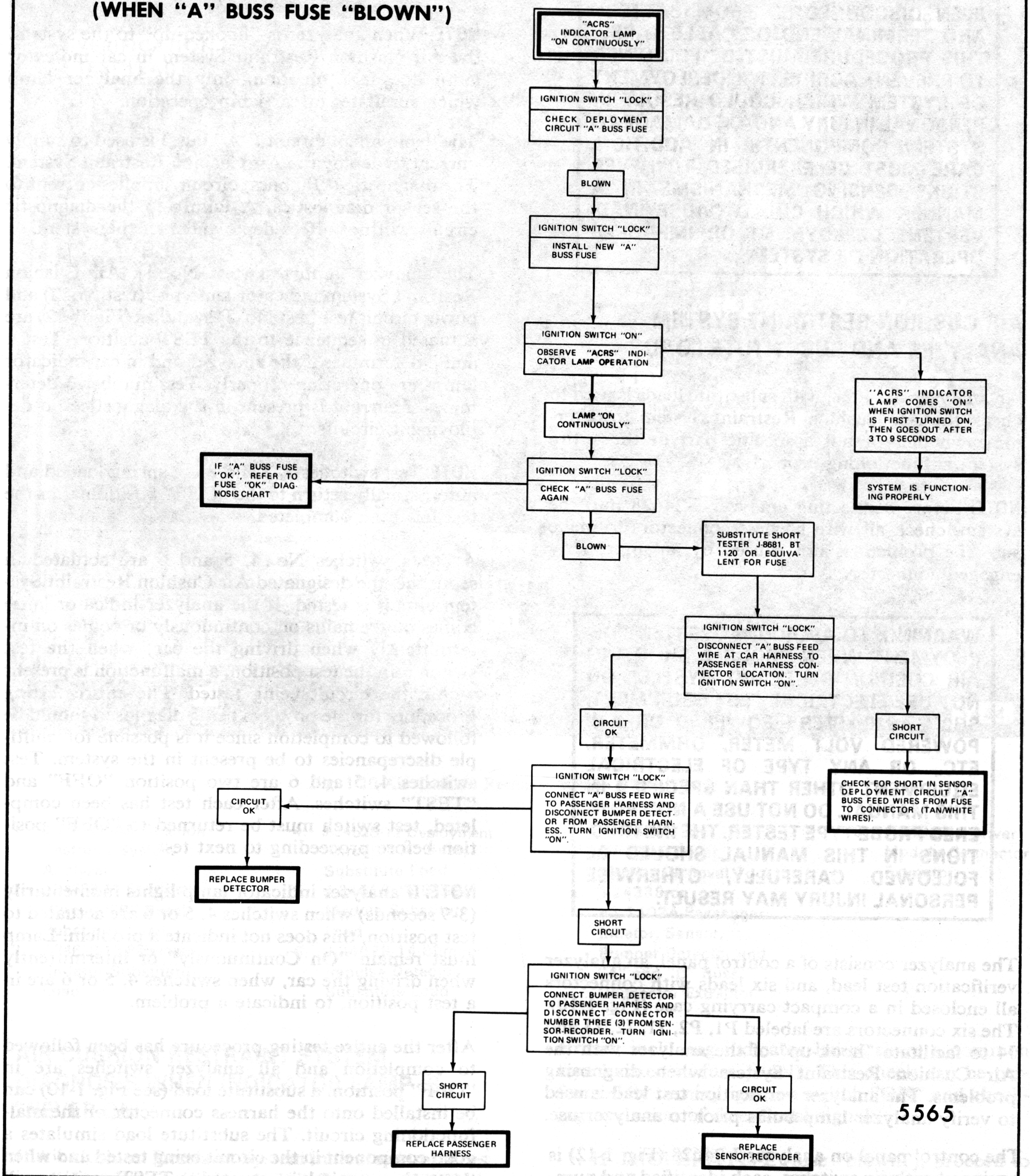
"ACRS" INDICATOR LAMP "ON CONTINUOUSLY"
IGNITION SWITCH "LOCK"
CHECK DEPLOYMENT CIRCUIT "A" BUSS FUSE
BLOWN
IGNITION SWITCH "LOCK"
INSTALL NEW "A" BUSS FUSE
IGNITION SWITCH "ON"
OBSERVE "ACRS" INDICATOR LAMP OPERATION
LAMP "ON CONTINUOUSLY"
IGNITION SWITCH "LOCK"
CHECK "A" BUSS FUSE AGAIN
IF "A" BUSS FUSE "OK", REFER TO FUSE "OK" DIAGNOSIS CHART
BLOWN
SUBSTITUTE SHORT TESTER J-8681, BT 1120 OR EQUIVALENT FOR FUSE
IGNITION SWITCH "LOCK"
DISCONNECT "A" BUSS FEED WIRE AT CAR HARNESS TO PASSENGER HARNESS CONNECTOR LOCATION. TURN IGNITION SWITCH "ON".
CIRCUIT OK
IGNITION SWITCH "LOCK"
CONNECT "A" BUSS FEED WIRE TO PASSENGER HARNESS AND DISCONNECT BUMPER DETECTOR FROM PASSENGER HARNESS. TURN IGNITION SWITCH "ON".
CIRCUIT OK
REPLACE BUMPER DETECTOR
SHORT CIRCUIT
IGNITION SWITCH "LOCK"
CONNECT BUMPER DETECTOR TO PASSENGER HARNESS AND DISCONNECT CONNECTOR NUMBER THREE (3) FROM SENSOR-RECORDER. TURN IGNITION SWITCH "ON".
SHORT CIRCUIT
REPLACE PASSENGER HARNESS
CIRCUIT OK
REPLACE SENSOR-RECORDER
SHORT CIRCUIT
CHECK FOR SHORT IN SENSOR DEPLOYMENT CIRCUIT "A" BUSS FEED WIRES FROM FUSE TO CONNECTOR (TAN/WHITE WIRES).
"ACRS" INDICATOR LAMP COMES "ON" WHEN IGNITION SWITCH IS FIRST TURNED ON, THEN GOES OUT AFTER 3 TO 9 SECONDS
SYSTEM IS FUNCTIONING PROPERLY
5565

Fig. 1-9-Air Cushion Restraint System Indicator Lamp "On Continuously" ("A" Buss Fuse Is Blown)

WARNING: DO NOT ATTEMPT ANY SERVICING OR DISCONNECTING OF AIR CUSHION RESTRAINT SYSTEM COMPONENTS UNTIL NEGATIVE CABLE HAS BEEN DISCONNECTED FROM BATTERY AND TERMINAL END OF CABLE TAPED. THIS PROCEDURE MUST BE FOLLOWED TO PREVENT ACCIDENTAL DEPLOYMENT OF SYSTEM WHICH COULD RESULT IN PERSONAL INJURY AND/OR DAMAGE TO SYSTEM COMPONENTS. IN ADDITION, CARE MUST BE EXERCISED TO NEVER STRIKE SENSING MECHANISMS IN A MANNER WHICH COULD CAUSE INADVERTENT DEPLOYMENT OR IMPROPER OPERATION OF SYSTEM.

AIR CUSHION RESTRAINT SYSTEM ANALYZER AND SUBSTITUTE LOADS

An analyzer, J-24628, with substitute loads is used to check the Air Cushion Restraint System to determine whether or not a specific part or the entire system is functioning properly.

NOTE: Before connecting analyzer J-24628 into the system, check all wire harness connectors to make sure the problem is not caused by an improperly engaged connector.

WARNING: TO AVOID INADVERTENT DEPLOYMENT WHEN TROUBLE SHOOTING AIR CUSHION RESTRAINT SYSTEM, DO NOT USE ELECTRICAL TEST EQUIPMENT, SUCH AS BATTERY POWERED OR A.C. POWERED VOLT METER, OHMMETER, ETC., OR ANY TYPE OF ELECTRICAL EQUIPMENT OTHER THAN SPECIFIED IN THIS MANUAL. DO NOT USE A NON-POWERED PROBE TYPE TESTER. THE INSTRUCTIONS IN THIS MANUAL SHOULD BE FOLLOWED CAREFULLY, OTHERWISE PERSONAL INJURY MAY RESULT.

The analyzer consists of a control panel, an analyzer verification test lead, and six leads with connectors all enclosed in a compact carrying case (Fig. 1-10). The six connectors are labeled P1, P2, J1, J2, J3 and J4 to facilitate "hook-up" of the analyzer with the Air Cushion Restraint System when diagnosing problems. The analyzer verification test lead is used to verify analyzer lamp bulbs prior to analyzer use.

The control panel on analyzer J-24628 (Fig. 1-12) is equipped with six switches, each identified and numbered, two power indicator lamps, and an analyzer indicator lamp. The analyzer indicator lamp simulates operation of the Air Cushion Restraint System indicator lamp on the instrument panel. The power indicator lamps are used to indicate whether current is present in the deployment and diagnostic circuits in the Air Cushion Restraint System.

NOTE: When analyzer is "hooked-up" to the system, the Air Cushion Restraint System in car indicator lamp does not function, only the analyzer lamp which simulates in car lamp operation.

The deployment circuit ("A" buss) is used to supply current to deploy the Air Cushion Restraint System. The diagnostic ("B" buss) circuit supplies current to the sensor diagnostics. A failure in the diagnostic circuit will not affect deployment of the system.

The analyzer lamp test (test No. 1), Air Cushion Restraint System indicator lamp test (test No. 2) and power circuit test (test No. 3) switches (Fig. 1-12) are actuated in sequence to the TEST position. Test 1 and 2 determines if the analyzer and in car indicator lamps are operating properly. Test number 3 determines if current is present in the diagnostic and deployment circuits.

NOTE: Test switches 1, 2 and 3 are spring loaded and automatically return to the "OFF" position after the test has been completed.

As tests switches No. 4, 5 and 6 are actuated in sequence, the designated Air Cushion Restraint System circuit is tested. If the analyzer indicator lamp comes on (remains on continuously or comes on intermittently when driving the car) when the test switch is in the test position, a malfunction is present within the circuit being tested. The entire testing procedure for the problem being diagnosed should be followed to completion since it is possible for multiple discrepancies to be present in the system. Test switches 4, 5 and 6 are two position "OFF" and "TEST" switches. After each test has been completed, test switch must be returned to "OFF" position before proceeding to next test.

NOTE: If analyzer indicator lamp lights momentarily (3-9 seconds) when switches 4, 5 or 6 are actuated to test position, this does not indicate a problem. Lamp must remain "On Continuously" or intermittently when driving the car, when switches 4, 5 or 6 are in a test position, to indicate a problem.

After the entire testing procedure has been followed to completion and all analyzer switches are in "OFF" position, a substitute load (see Fig. 1-10) can be installed onto the harness connector of the malfunctioning circuit. The substitute load simulates a good component in the circuit being tested and when the analyzer switch is actuated to TEST position will isolate the discrepancy as to either the component or the harness.

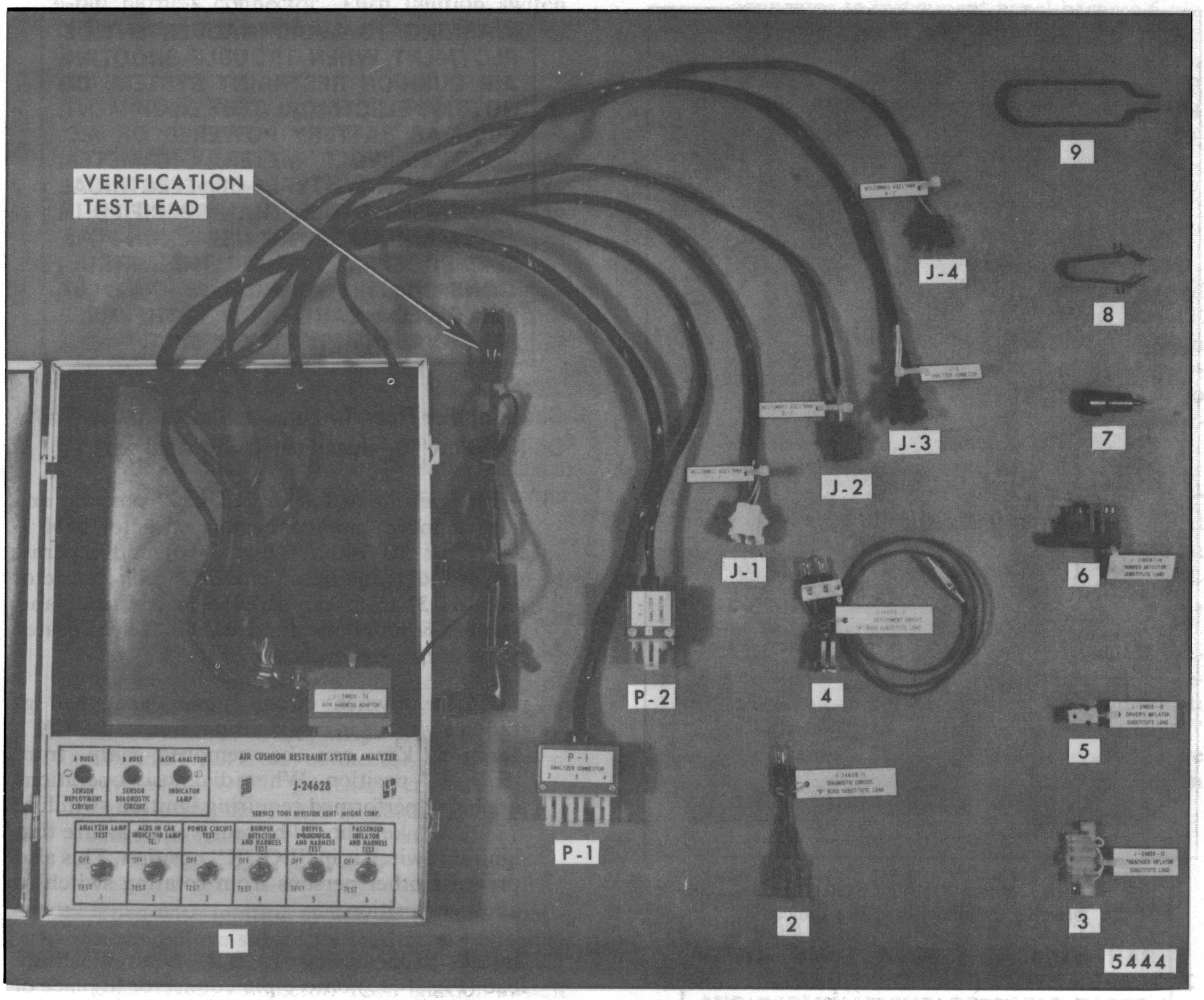

Fig. 1-10-Air Cushion Restraint System Special Tools

1. J-24628-Air Cushion Restraint System Analyzer
2. J-24628-11 Diagnostic Circuit ("B" Buss) Substitute Load
3. J-24628-13 Passenger Inflator Substitute Load
4. J-24628-12 Deployment Circuit ("A" Buss) Substitute Load
5. J-24628-15-Driver Module Substitute Load
6. J-24628-14-Bumper Impulse Detector Substitute Load
7. J-24628-2 or BT-7405-Driver Module Removal Tool
8. J-24388 or BT-7402A-Passenger Inflator, Sensor, Bumper Detector and "A" and "B" Buss Connector Extractor
9. J-24628-3-Driver Module Connector Extractor

AIR CUSHION RESTRAINT SYSTEM DIAGNOSIS WHEN INDICATOR LAMP IS "NEVER-ON"

If Air Cushion Restraint System indicator lamp does not light when ignition switch is first turned "ON", check diagnostic circuit "B" buss fuse (directional signal and Air Cushion Restraint System diagnostic circuit, including indicator lamp, share a common fuse located in fuse panel). This check can be performed by turning ignition switch "ON" and checking operation of directional signal:

1. IF INOPERATIVE (fuse "blown"), proceed to checking procedure "Checking For Short Circuits That Cause Blown "B" Buss Fuse (With Short Tester)".

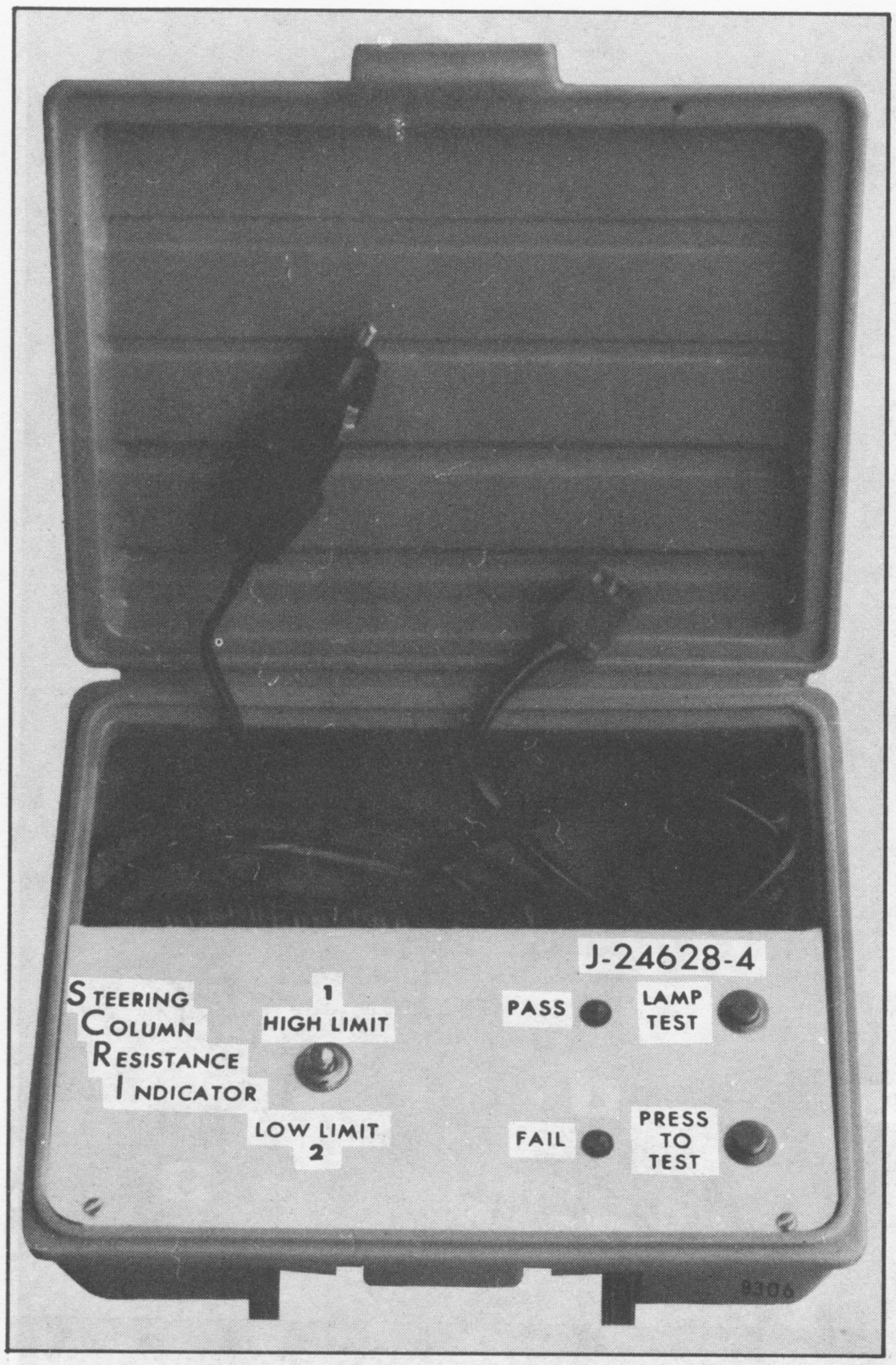

Fig. 1-11-Air Cushion Restraint System Special Tool - Steering Column Resistance Indicator

2. IF OPERATIVE (fuse "OK"), proceed to checking procedure "Checking For Open Circuits or Short Circuits That Do Not Blow "B" Buss Fuse (With Analyzer)".

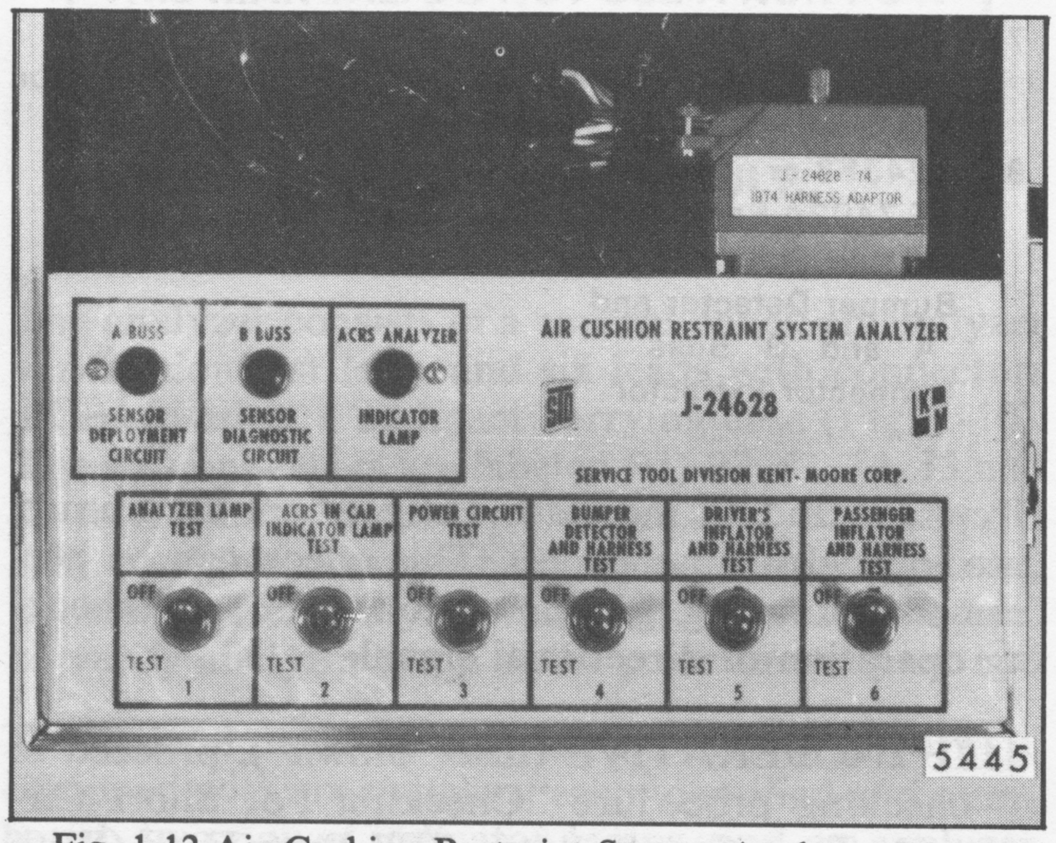

Fig. 1-12-Air Cushion Restraint System Analyzer J-24628 Control Panel

WARNING: TO AVOID INADVERTENT DEPLOYMENT WHEN TROUBLE SHOOTING AIR CUSHION RESTRAINT SYSTEM, DO NOT USE ELECTRICAL TEST EQUIPMENT, SUCH AS BATTERY POWERED OR A.C. POWERED VOLT METER, OHMMETER, ETC., OR ANY TYPE OF ELECTRICAL EQUIPMENT OTHER THAN SPECIFIED IN THIS MANUAL. DO NOT USE A NON-POWERED PROBE TYPE TESTER. THE INSTRUCTIONS IN THIS MANUAL SHOULD BE FOLLOWED CAREFULLY, OTHERWISE PERSONAL INJURY MAY RESULT.

Checking For Open Circuits or Short Circuits That Do Not Blow "B" Buss Fuse (With Analyzer)

1. With ignition switch in "LOCK" position and key removed, use connector extractor tool J-24388 or BT-7402A (Fig. 1-10) and separate diagnostic ("B" buss) circuit 4-pin connector (Fig. 1-13) from car division instrument panel harness 6-pin connector (red connector located above sensor-recorder).

   NOTE: Deployment circuit is energized when ignition switch is in any position except "LOCK". Ignition key can be removed only from "LOCK" position. When diagnosis operations are being performed requiring ignition switch in "LOCK", key should be removed to assure that ignition switch is in "LOCK" position. This also prevents other persons from rotating switch to another position.

2. Install diagnostic circuit ("B" buss) substitute load (Fig. 1- 13) onto 6-pin connector in place of

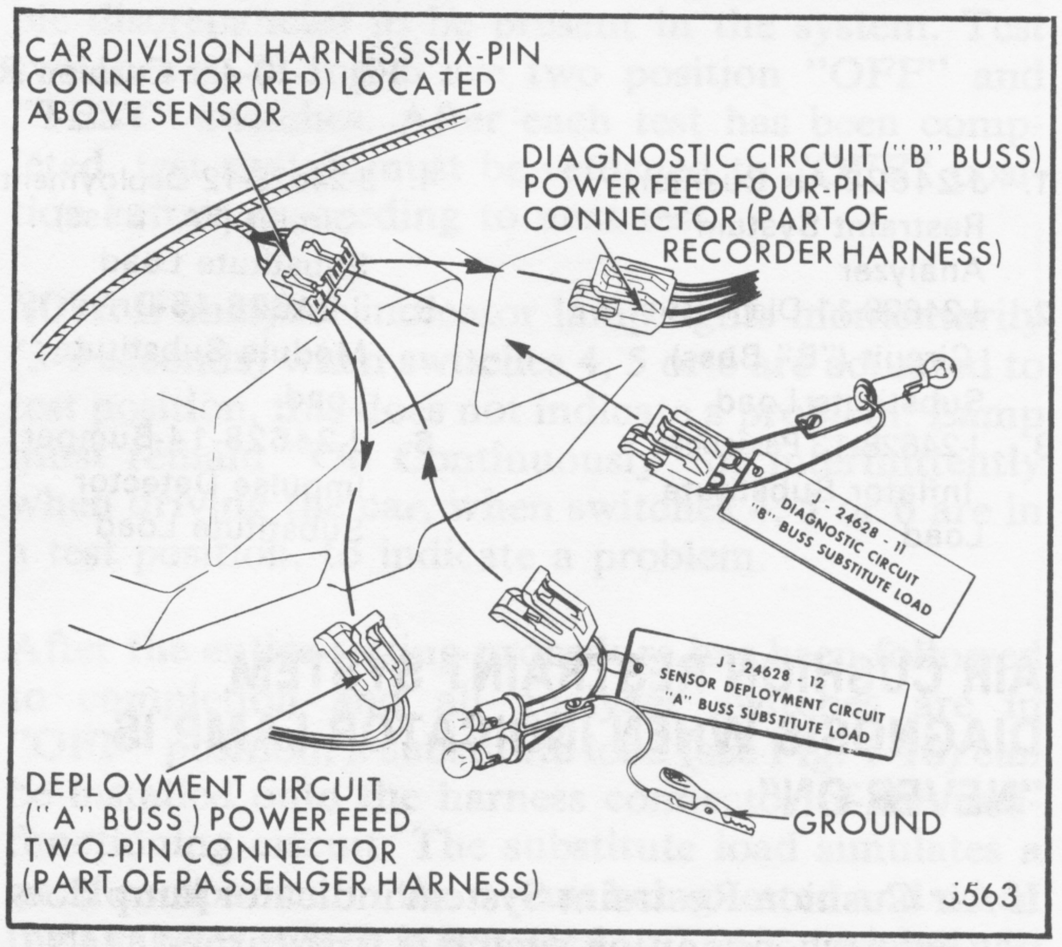
CAR DIVISION HARNESS SIX-PIN CONNECTOR (RED) LOCATED ABOVE SENSOR
DIAGNOSTIC CIRCUIT ("B" BUSS) POWER FEED FOUR-PIN CONNECTOR (PART OF RECORDER HARNESS)
J - 24628 - 11
DIAGNOSTIC CIRCUIT "B" BUSS SUBSTITUTE LOAD
J - 24628 - 12
SENSOR DEPLOYMENT CIRCUIT "A" BUSS SUBSTITUTE LOAD
GROUND
DEPLOYMENT CIRCUIT ("A" BUSS) POWER FEED TWO-PIN CONNECTOR (PART OF PASSENGER HARNESS)
3563

Fig. 1-13-Deployment ("A" Buss) and Diagnostic ("B" Buss) Feed Circuit Substitute Loads

4-pin harness connector. Turn ignition switch "ON" and recheck directional signal ("B" buss) fuse:

a. IF FUSE "OK", proceed to Step 3.

b. IF FUSE "BLOWN", turn ignition switch to lock and remove key. Repair short circuit in Air Cushion Restraint System indicator lamp feed wire (light green wire in instrument panel harness from indicator lamp to 6- pin red connector) to make indicator lamp and substitute load test lamp light. Replace fuse, then proceed to Step 4 to eliminate the possibility of multiple problems in system.

3. Turn ignition switch "ON" and observe operation of test lamp on "B" buss substitute load and Air Cushion Restraint System indicator lamp for one of the following conditions:

a. IF AIR CUSHION RESTRAINT SYSTEM INDICATOR LAMP AND SUBSTITUTE LOAD TEST BULB DOES NOT LIGHT, check for open circuit in ground wire (Black) from 6-pin connector to ground location or diagnostic circuit "B" buss feed wire (Dark Green-Double White stripe wire) from fuse block to 6-pin (Red) connector. With ignition switch in "LOCK" position and key removed, repair or replace wires as necessary to make substitute load bulb and indicator lamp light.

Then with ignition switch in "LOCK" position, remove substitute load and connect 4-pin connector to instrument panel harness 6-pin (Red) connector. Turn ignition switch "ON" and observe Air Cushion Restraint System indicator lamp operation. IF LAMP COMES ON WHEN IGNITION SWITCH IS FIRST TURNED ON AND GOES OUT AFTER 3 TO 9 SECONDS, system is functioning properly. IF INDICATOR LAMP DOES NOT LIGHT, proceed to Step 4.

b. IF AIR CUSHION RESTRAINT SYSTEM INDICATOR LAMP DOES NOT LIGHT AND SUBSTITUTE LOAD TEST BULB LIGHTS, check for open circuit in indicator lamp feed or ground wires (Light Green or Purple wires) from 6-pin (Red) connector to indicator lamp. Also, check indicator lamp bulb. Replace bulb, if burned out, or repair or replace wires as required to make indicator lamp and substitute load test lamp light.

With ignition switch in "LOCK" position, remove substitute load and connect 4-pin connector to instrument panel harness 6-pin (Red) connector. Turn ignition switch "ON" and observe Air Cushion Restraint System indicator lamp operation. IF LAMP COMES ON WHEN IGNITION SWITCH IS FIRST TURNED ON AND GOES OUT AFTER 3 TO 9 SECONDS, system is functioning properly. IF INDICATOR LAMP DOES NOT LIGHT, proceed to Step 4.

c. IF AIR CUSHION RESTRAINT SYSTEM INDICATOR LAMP AND SUBSTITUTE LOAD TEST LAMP LIGHTS, turn ignition switch to "LOCK" position and remove substitute load. Then connect 4-pin connector to instrument panel harness 6-pin (Red) connector and proceed to Step 4.

4. Check Air Cushion Restraint System analyzer (J-24628) lamps by plugging verification test lead (Fig. 1-10) into cigar lighter and performing analyzer lamp test No. 1 (Fig. 1-12). IF ALL THREE ANALYZER TEST LAMPS LIGHT, continue with analyzer "hook-up". IF ONE OR MORE OF TEST LAMPS DO NO LIGHT, replace defective bulb(s) or repair analyzer as required. Remove verification test lead plug from cigar lighter. With ignition switch in "LOCK" and key removed, disconnect and tape negative terminal of battery. Then connect Air Cushion Restraint System analyzer.

WARNING: DO NOT ATTEMPT ANY SERVICING OR DISCONNECTING OF AIR CUSHION RESTRAINT SYSTEM COMPONENTS UNTIL NEGATIVE CABLE HAS BEEN DISCONNECTED FROM BATTERY AND TERMINAL END OF CABLE TAPED. THIS PROCEDURE MUST BE FOLLOWED TO PREVENT ACCIDENTAL DEPLOYMENT OF SYSTEM WHICH COULD RESULT IN PERSONAL INJURY AND/OR DAMAGE TO SYSTEM COMPONENTS. IN ADDITION, CARE MUST BE EXERCISED TO NEVER STRIKE SENSING MECHANISMS IN A MANNER WHICH COULD CAUSE INADVERTENT DEPLOYMENT OR IMPROPER OPERATION OF SYSTEM.

NOTE: Before connecting analyzer J-24628 into system, check all wire harness connectors to make sure problem is not caused by an improperly engaged connector.

5. Remove sensor-recorder attaching screws and lower sensor- recorder for easier access to harness connectors (as described in Section 2-Instrument Panel Components).

6. Connect Air Cushion Restraint System analyzer J-24628, with Air Cushion Restraint System as follows (Fig. 1-14):

   a. Using connector extractor tool J-24388 or BT-7402A (Fig. 1-10), disconnect all harness connectors from sensor-recorder.

   b. Connect analyzer 8-pin recorder connector (J1) to side of sensor- recorder.

   c. Connect analyzer 3-pin (J2), 8-pin (J3) and 4-pin (J4) connectors to sensor 15-pin connector (located at front of sensor-recorder).

   d. Connect wire harness connectors No. 2, 3 and 4 to analyzer 15-pin connector (P1).

   e. Connect 8-pin recorder harness connector No. 1 (White) to analyzer connector (P2).

7. Reinstall sensor-recorder with one screw. Install screw with the ring ground.

WARNING: CARE MUST BE EXERCISED TO NEVER STRIKE SENSING MECHANISMS IN A MANNER WHICH COULD CAUSE INADVERTENT DEPLOYMENT OR IMPROPER OPERATION OF SYSTEM, OTHERWISE SERIOUS INJURY MAY RESULT.

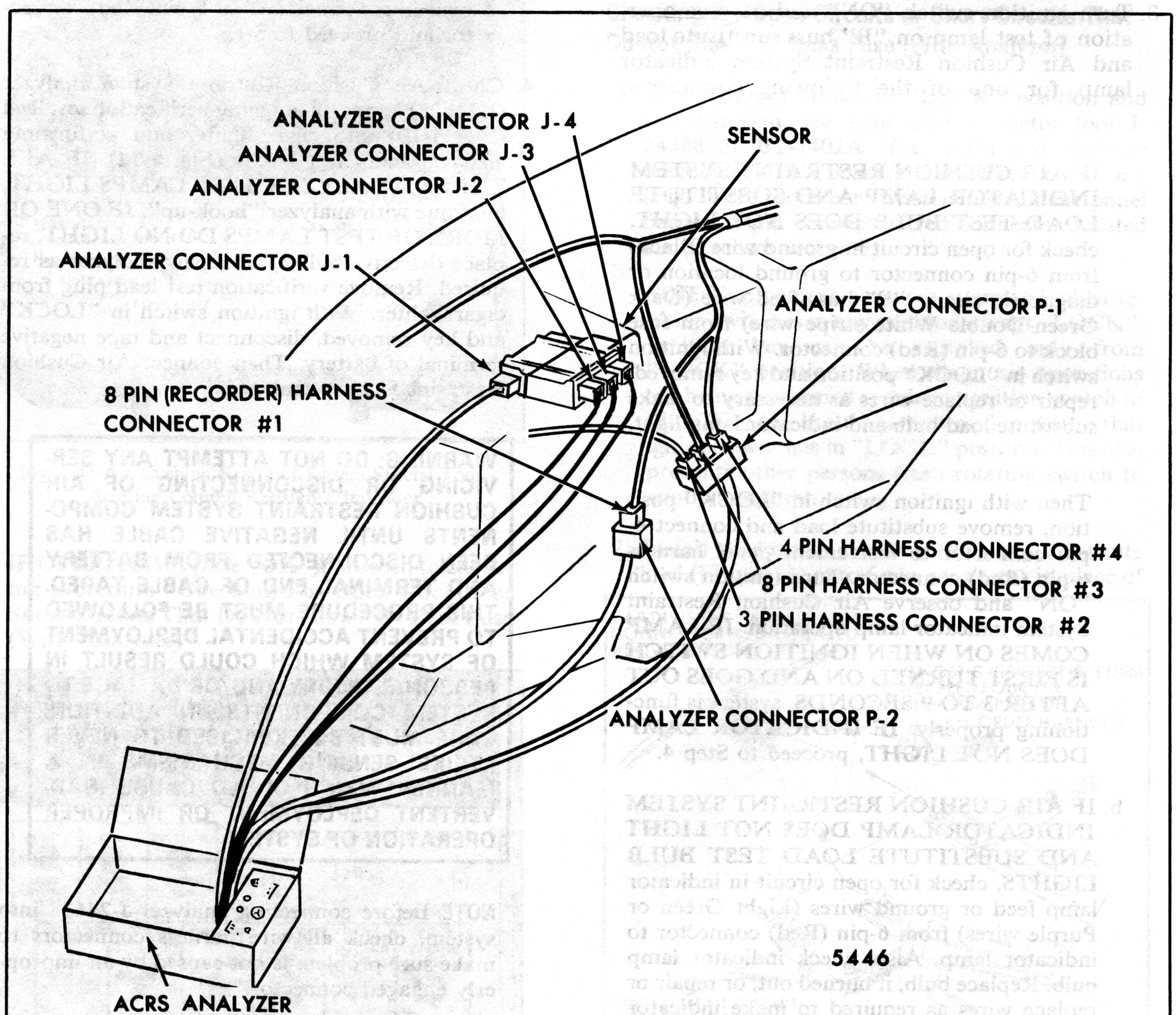

Fig. 1-14-Air Cushion Restraint System Analyzer "Hook-Up"

8. Connect negative terminal to battery. Turn ignition switch "ON" and perform analyzer test No. 2. Then observe operation of Air Cushion Restraint System indicator lamp while performing test:

   a. IF AIR CUSHION RESTRAINT SYSTEM IN CAR INDICATOR LAMP DOES NOT LIGHT OR BLOWS DIRECTIONAL SIGNAL FUSE WHEN PERFORMING ANALYZER TEST NO. 2, replace sensor-recorder harness (observe WARNING after Step 4). Then, continue with diagnosis b. to eliminate possibility of multiple problems in system.

   b. IF AIR CUSHION RESTRAINT SYSTEM IN CAR INDICATOR LAMP LIGHTS WHEN PERFORMING ANALYZER TEST NO. 2, proceed to Step 9.

9. Perform analyzer test No. 3 and observe analyzer "B" buss power circuit lamp:

   a. IF "B" BUSS POWER CIRCUIT LAMP ON ANALYZER DOES NOT LIGHT WHEN PERFORMING TEST NO. 3, replace recorder harness.

   b. IF "B" BUSS POWER CIRCUIT LAMP LIGHTS WHEN PERFORMING TEST NO. 3, proceed to Step 10.

10. Turn ignition switch to "LOCK", then "ON", and observe operation of analyzer indicator lamp:

    a. IF ANALYZER INDICATOR LAMP DOES NOT LIGHT (OFF), replace sensor-recorder as described in Section 2-Instrument Panel Components (observe WARNING after Step 4).

    b. IF ANALYZER INDICATOR LAMP COMES "ON", THEN GOES OUT AFTER 3-9 SECONDS, replace recorder harness.

    NOTE: If recorder harness was diagnosed as defective and replaced when performing Steps 8 or 9, proceed to Step 11.

11. Turn ignition switch to "LOCK" and remove key. Disconnect negative cable from battery and tape terminal end of cable. Observe WARNING after Step 4, then remove attaching screw from ring ground at sensor-recorder and lower sensor-recorder.

12. Disconnect analyzer from Air Cushion Restraint System by using connector extractor tool J-24388 or BT-7402A and connect all previously removed harnesses. Reinstall sensor-recorder and torque attaching screws to 57-87 inch pounds.

13. Connect negative cable to battery. Turn ignition switch "ON", and observe operation of Air Cushion Restraint System in-car indicator lamp:

    a. IF INDICATOR LAMP LIGHTS WHEN IGNITION SWITCH IS FIRST TURNED ON AND GOES OUT AFTER 3-9 SECONDS, system is functioning properly.

    b. IF INDICATOR LAMP DOES NOT LIGHT ("NEVER ON"), continue with diagnosis.

Checking For Short Circuits That Cause Blown "B" Buss Fuse (With Short Tester)

1. With ignition switch in locked position, replace directional signal fuse ("B" buss) located in fuse block.

2. Turn ignition switch "ON" and recheck operation of directional signal:

   a. IF "OPERATIVE" (fuse "OK"), proceed to Step 3.

   b. IF "INOPERATIVE" (fuse "blown"), proceed to Step 5.

3. Check operation of circuits listed below which are also protected by directional signal fuse. Then recheck directional signal fuse:

   a. BUICK STYLES - cruise control, back-up lamps and directional signal.

   b. OLDSMOBILE STYLES - back-up lamps and directional signal.

   c. CADILLAC STYLES - directional signal only.

   IF DIRECTIONAL SIGNAL FUSE "BLOWS" WHEN CHECKING ONE OF THE ABOVE CIRCUITS, substitute short tester J-8681 or BT-1120 for fuse. Then locate and repair short, as required, and replace directional signal fuse. Then proceed to Step 4.

4. IF DIRECTIONAL SIGNAL FUSE IS "OK", turn ignition switch "ON" and observe operation of Air Cushion Restraint System indicator lamp:

a. IF INDICATOR LAMP LIGHTS WHEN IGNITION SWITCH IS FIRST TURNED ON AND GOES OUT AFTER 3-9 SECONDS, system is functioning properly.

b. IF INDICATOR LAMP DOES NOT LIGHT WHEN IGNITION SWITCH IF FIRST TURNED ON AND DIRECTIONAL SIGNAL FUSE IS "OK", refer to procedure "Checking For Open Circuits Or Short Circuits That Do Not Blow "B" Buss Fuse (With Analyzer)".

5. Substitute short tester J-8681 or BT-1120 for "B" buss fuse. With ignition switch in "LOCK" position and key removed, use connector extractor tool J-24388 or BT-7402A and separate recorder harness 4-pin diagnostic ("B" buss) circuit connector from instrument panel car harness 6-pin connector (red connector located above sensor-recorder Fig. 1-13).

NOTE: Deployment circuit is energized when ignition switch is in any position except "LOCK". Ignition key can be removed only from "LOCK" position. When diagnosis operations are being performed requiring ignition switch in "LOCK", key should be removed to assure that ignition switch is in "LOCK" position. This also prevents other persons from rotating switch to another position.

Short tester J-8681 or BT-1120 indicates a short by producing a clicking noise and/or by a flashing lamp.

6. Turn ignition switch "ON" and observe operation of short tester:

a. IF SHORT TESTER INDICATES A SHORT CIRCUIT, repair or replace "B" buss feed wire from fuse block to 6-pin (Red) connector (diagnostic circuit "B" buss feed wire - dark green with double white stripe) or other circuits on same fuse listed in Step 3. After short has been located and corrected, replace directional signal fuse. With ignition switch in "LOCK" position and key removed, connect recorder harness 4- pin connector to instrument panel car harness 6-pin (Red) connector. Then perform Step 4.

b. IF SHORT TESTER DOES NOT INDICATE A SHORT CIRCUIT, with ignition switch in "LOCK" position, disconnect negative cable from battery and tape terminal end of cable.

WARNING: DO NOT ATTEMPT ANY SERVICING OR DISCONNECTING OF AIR CUSHION RESTRAINT SYSTEM COMPONENTS UNTIL NEGATIVE CABLE HAS BEEN DISCONNECTED FROM BATTERY AND TERMINAL END OF CABLE TAPED. THIS PROCEDURE MUST BE FOLLOWED TO PREVENT ACCIDENTAL DEPLOYMENT OF SYSTEM WHICH COULD RESULT IN PERSONAL INJURY AND/OR DAMAGE TO SYSTEM COMPONENTS. IN ADDITION, CARE MUST BE EXERCISED TO NEVER STRIKE SENSING MECHANISMS IN A MANNER WHICH COULD CAUSE INADVERTENT DEPLOYMENT OR IMPROPER OPERATION OF THE SYSTEM.

7. Connect recorder harness 4-pin connector to instrument panel car harness 6-pin (Red) connector and disconnect recorder harness 8-pin connector (Fig. 1-15) from side of sensor-recorder (connector No. 1 - white).

NOTE: To disconnect recorder harness 8-pin connector, sensor-recorder attaching screws must be removed and sensor-recorder lowered to gain access to the connector location (as described in "Sensor-Recorder - Removal and Installation" procedure in Section 2-Instrument Panel Components).

After recorder harness 8-pin connector, has been disconnected from sensor-recorder, reinstall sensor with one (1) screw. Install screw with the ring ground.

WARNING: CARE MUST BE EXERCISED TO NEVER STRIKE SENSING MECHANISMS IN A MANNER WHICH COULD CAUSE INADVERTENT DEPLOYMENT OR IMPROPER OPERATION OF SYSTEM, OTHERWISE PERSONAL INJURY MAY RESULT.

8. Connect battery. Turn ignition switch to "ON" position and observe operation of short tester:

a. IF SHORT TESTER DOES NOT INDICATE A SHORT CIRCUIT, replace sensor-recorder as described in "Sensor-Recorder - Removal and Installation" procedure in Section 2-Instrument Panel Components. Remove short tester from fuse block and install a new fuse. Then perform Step 4.

b. IF SHORT TESTER INDICATES A SHORT CIRCUIT, with ignition switch in "LOCK" position, disconnect negative cable

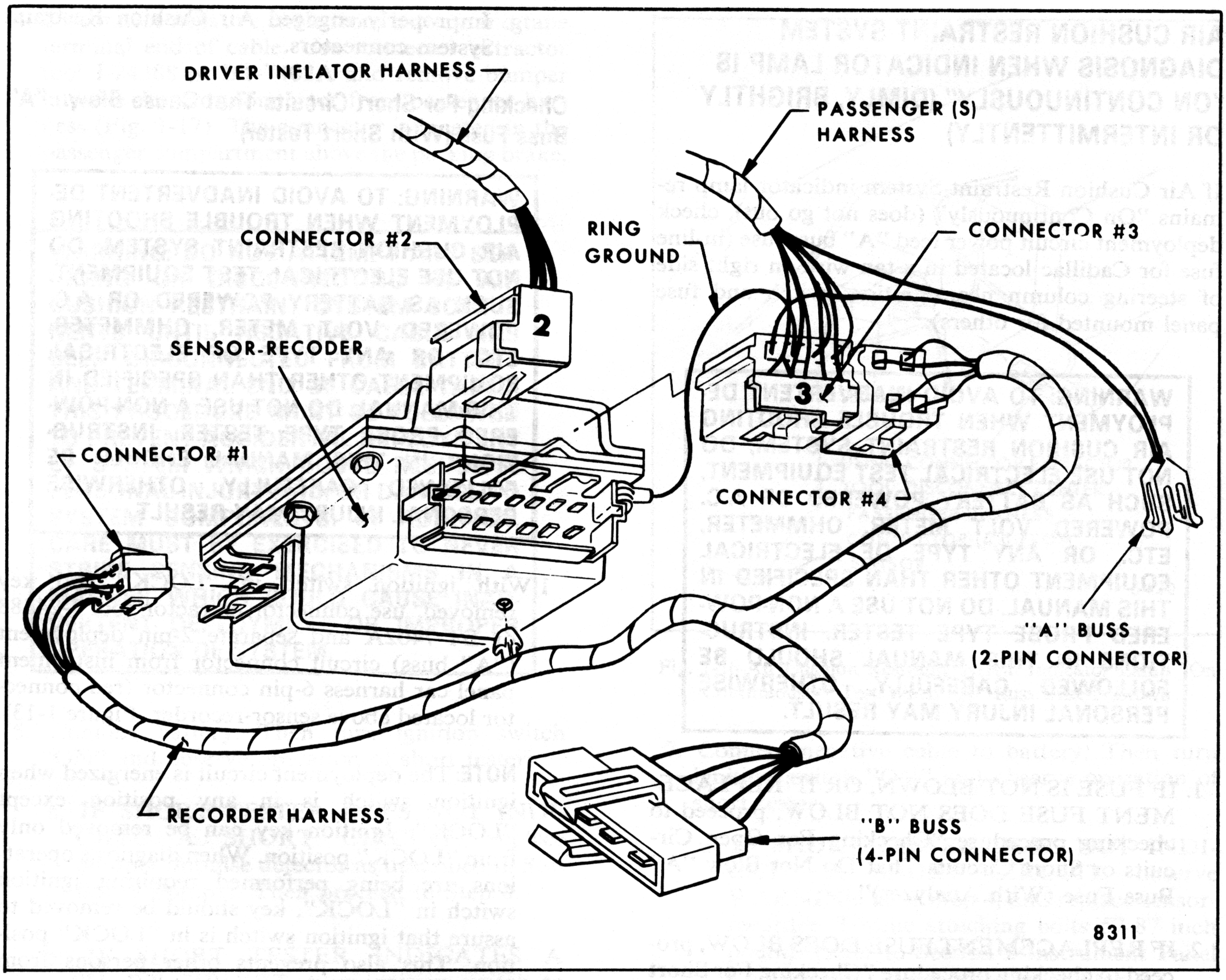

Fig. 1-15-Air Cushion Restraint System Sensor-Recorder Installation

from battery and tape terminal end of cable (observe WARNING following Step 6).

Remove sensor-recorder attaching screw and lower sensor. Connect recorder harness 8-pin connector to sensor (connector No. 1, Fig. 1-15) and disconnect recorder harness 4-pin connector from sensor- recorder (connector No. 4). Reinstall sensor with one screw. Install screw with ring ground.

WARNING: CARE MUST BE EXERCISED TO NEVER STRIKE SENSING MECHANISMS IN A MANNER WHICH COULD CAUSE INADVERTENT DEPLOYMENT OR IMPROPER OPERATION OF SYSTEM, OTHERWISE PERSONAL INJURY MAY RESULT.

9. Connect battery. Turn ignition switch to "ON" position and observe operation of short tester:

a. IF SHORT TESTER DOES NOT INDICATE A SHORT CIRCUIT, replace sensor-recorder as described in "Sensor-Recorder - Removal and Installation" procedure in Section 2-Instrument Panel Components. Remove short tester from fuse block and install a new fuse. Then perform Step 4.

b. IF SHORT TESTER INDICATES A SHORT CIRCUIT, replace recorder harness as described in "Recorder Harness - Removal and Installation" procedure in Section 2-Instrument Panel Components. Remove short tester from fuse block and install a new fuse. Then perform Step 4.

AIR CUSHION RESTRAINT SYSTEM DIAGNOSIS WHEN INDICATOR LAMP IS "ON CONTINUOUSLY" (DIMLY, BRIGHTLY OR INTERMITTENTLY)

If Air Cushion Restraint System indicator lamp remains "On Continuously" (does not go out), check deployment circuit power feed "A" buss fuse (in-line fuse for Cadillac located in a tan wire on right side of steering column near ignition switch and fuse panel mounted for others):

WARNING: TO AVOID INADVERTENT DEPLOYMENT WHEN TROUBLE SHOOTING AIR CUSHION RESTRAINT SYSTEM, DO NOT USE ELECTRICAL TEST EQUIPMENT, SUCH AS BATTERY POWERED OR A.C. POWERED VOLT METER, OHMMETER, ETC., OR ANY TYPE OF ELECTRICAL EQUIPMENT OTHER THAN SPECIFIED IN THIS MANUAL. DO NOT USE A NON-POWERED PROBE TYPE TESTER. INSTRUCTIONS IN THIS MANUAL SHOULD BE FOLLOWED CAREFULLY, OTHERWISE PERSONAL INJURY MAY RESULT.

1. IF FUSE IS NOT BLOWN, OR IF REPLACEMENT FUSE DOES NOT BLOW, proceed to checking procedure "Checking For Open Circuits or Short Circuits That Do Not Blow "A" Buss Fuse (With Analyzer)".

2. IF REPLACEMENT FUSE DOES BLOW, proceed to checking procedure "Checking For Short Circuits That Cause Blown "A" Buss Fuses (With Short Tester)".

NOTE: Indicator lamp may detect loose connections before they become loose enough to cause problems in other circuits, such as headlamp flicker. IF INDICATOR LAMP OPERATES INTERMITTENTLY, check for loose connections at the following locations:

a. Battery cables to battery.

b. Battery cables to engine block and starter solenoid.

c. Cable connection on the junction block.

d. The ignition switch connector.

e. The bulk head connector on the dash panel (RED feed wire).

f. Loose fuse in the "A" buss fuse holder.

g. Improperly engaged Air Cushion Restraint System connectors.

Checking For Short Circuits That Cause Blown "A" Buss Fuse (With Short Tester)

WARNING: TO AVOID INADVERTENT DEPLOYMENT WHEN TROUBLE SHOOTING AIR CUSHION RESTRAINT SYSTEM, DO NOT USE ELECTRICAL TEST EQUIPMENT, SUCH AS BATTERY POWERED OR A.C. POWERED VOLT METER, OHMMETER, ETC., OR ANY TYPE OF ELECTRICAL EQUIPMENT OTHER THAN SPECIFIED IN THIS MANUAL. DO NOT USE A NON-POWERED PROBE TYPE TESTER. INSTRUCTIONS IN THIS MANUAL SHOULD BE FOLLOWED CAREFULLY, OTHERWISE PERSONAL INJURY MAY RESULT.

1. With ignition switch in "LOCK" and key removed, use connector extractor tool J-24388 or BT-7402A and separate 2-pin deployment ("A" buss) circuit connector from instrument panel car harness 6-pin connector (red connector located above sensor-recorder, Figure 1-13).

NOTE: The deployment circuit is energized when ignition switch is in any position except "LOCK". Ignition key can be removed only from "LOCK" position. When diagnosis operations are being performed requiring ignition switch in "LOCK", key should be removed to assure that ignition switch is in "LOCK" position. This also prevents other persons from rotating switch to another position.

2. Remove blown fuse and connect short tester J-8681 or BT-1120, to input and output side of fuse clips or wires.

3. Turn ignition switch "ON" and observe operation of short tester:

a. IF SHORT TESTER INDICATES A SHORT CIRCUIT, repair or replace harness from fuse block to 6-pin (Red) connector (tan/white wires from fuse to connector). Then proceed to Step 8.

b. IF SHORT TESTER DOES NOT INDICATE A SHORT CIRCUIT, turn ignition switch to "LOCK" and remove key. Connect 2-pin connector to instrument panel car harness 6-pin (Red) connector.

NOTE: Short tester J-8681 or BT-1120 indicates a short by producing a clicking noise and/or by a flashing lamp.

4. Disconnect negative cable from battery and tape terminal end of cable. Use connector extractor tool J-24388 or BT-7402A and remove bumper impulse detector connector from passenger harness (Fig. 1-17). The connector is located in the passenger compartment above the parking brake.

WARNING: DO NOT ATTEMPT ANY SERVICING OR DISCONNECTING OF AIR CUSHION RESTRAINT SYSTEM COMPONENTS UNTIL NEGATIVE CABLE HAS BEEN DISCONNECTED FROM BATTERY AND TERMINAL END OF CABLE TAPED. THIS PROCEDURE MUST BE FOLLOWED TO PREVENT ACCIDENTAL DEPLOYMENT OF SYSTEM WHICH COULD RESULT IN PERSONAL INJURY AND/OR DAMAGE TO SYSTEM COMPONENTS. IN ADDITION, CARE MUST BE EXERCISED TO NEVER STRIKE SENSING MECHANISMS IN A MANNER WHICH COULD CAUSE INADVERTENT DEPLOYMENT OR IMPROPER OPERATION OF SYSTEM.

5. Connect battery. Then turn ignition switch "ON" and observe operation of short tester:

   a. IF SHORT TESTER DOES NOT INDICATE A SHORT CIRCUIT, replace bumper impulse detector as described in Section 3-Bumper. Then proceed to Step 8.

   b. IF SHORT TESTER INDICATES A SHORT CIRCUIT, turn ignition switch to "LOCK" and remove key. Disconnect negative cable from battery and tape terminal end of cable (observe WARNING after Step 4). Then connect bumper impulse connector to passenger harness. Then proceed to Step 6.

6. Remove sensor-recorder attaching screws and lower sensor- recorder for easier access to connectors (refer to Section 2-Instrument Panel Components for sensor removal). Use connector extractor tool J- 24388 or BT-7402A and disconnect 8-pin connector (connector No. 3) from sensor (Fig. 1-16). Reinstall sensor with one screw. Install screw with ring ground (Fig. 1-15).

WARNING: CARE MUST BE EXERCISED TO NEVER STRIKE SENSING MECHANISMS IN A MANNER WHICH COULD CAUSE INADVERTENT DEPLOYMENT OR IMPROPER OPERATION OF SYSTEM, OTHERWISE PERSONAL INJURY MAY RESULT.

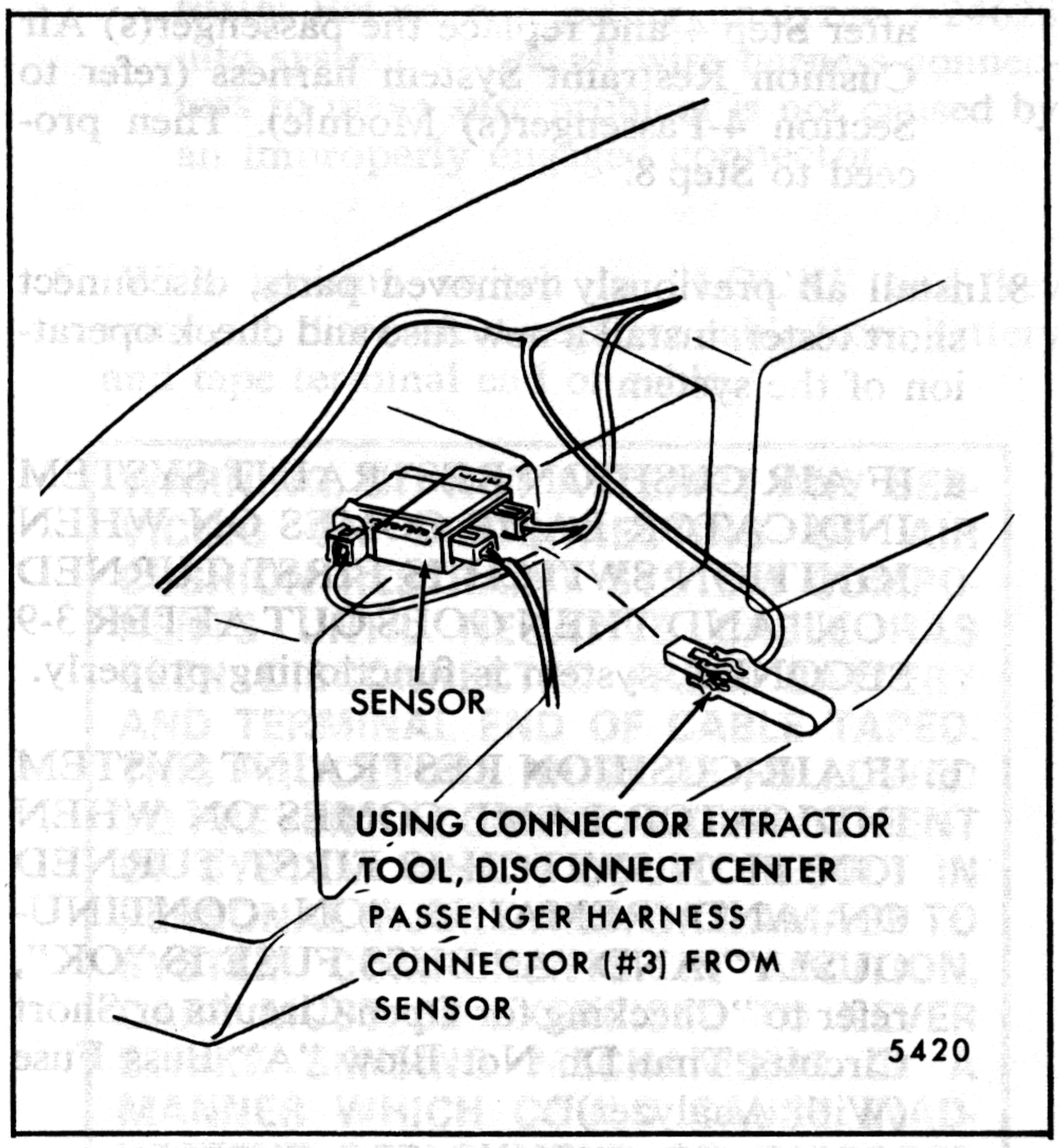

Fig. 1-16-Air Cushion Restraint System Indicator Lamp "On Continuously" Test When "A" Buss Fuse is Blown

7. Connect negative cable to battery. Then turn ignition switch "ON" and observe operation of short tester:

   a. IF SHORT TESTER DOES NOT INDICATE A SHORT CIRCUIT, observe WARNING after Step 4, and replace sensor-recorder. Torque attaching bolts 57-87 inch pounds (refer to Section 2-Instrument Panel Components). Then proceed to Step 8.

   b. IF SHORT TESTER INDICATES A SHORT CIRCUIT, observe WARNING

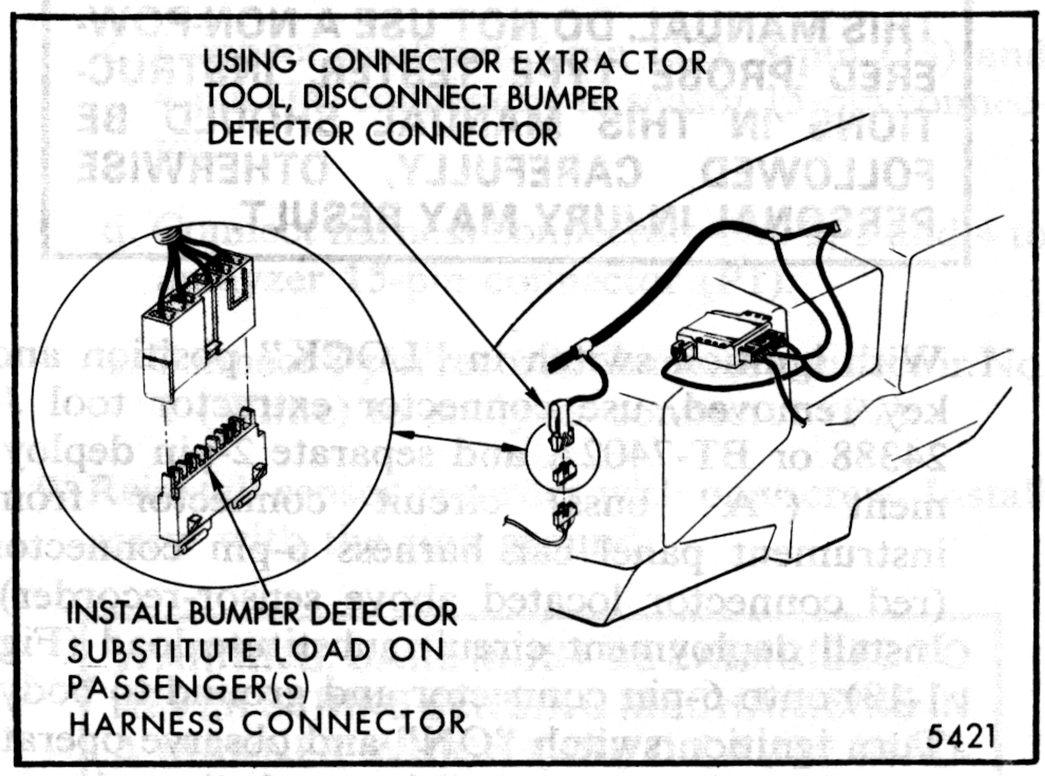
USING CONNECTOR EXTRACTOR TOOL, DISCONNECT BUMPER DETECTOR CONNECTOR
INSTALL BUMPER DETECTOR SUBSTITUTE LOAD ON PASSENGER(S) HARNESS CONNECTOR
5421

Fig. 1-17-Air Cushion Restraint System Indicator Lamp "On Continuously" Test - Bumper Detector Substitute Load Installation

after Step 4 and replace the passenger(s) Air Cushion Restraint System harness (refer to Section 4-Passenger(s) Module). Then proceed to Step 8.

8. Install all previously removed parts, disconnect short tester, install a new fuse and check operation of the system:

   a. IF AIR CUSHION RESTRAINT SYSTEM INDICATOR LAMP COMES ON WHEN IGNITION SWITCH IS FIRST TURNED "ON" AND THEN GOES OUT AFTER 3-9 SECONDS, system is functioning properly.

   b. IF AIR CUSHION RESTRAINT SYSTEM INDICATOR LAMP COMES ON WHEN IGNITION SWITCH IS FIRST TURNED ON AND REMAINS "ON CONTINUOUSLY" AND "A" BUSS FUSE IS "OK", refer to "Checking for Open Circuits or Short Circuits That Do Not Blow "A" Buss Fuse (With Analyzer)".

NOTE: Sensor-recorder attaching screws must be torqued to 57-87 inch pounds.

Checking For Open Circuits or Short Circuits That Do Not Blow "A" Buss Fuse (With Analyzer)

WARNING: TO AVOID INADVERTENT DEPLOYMENT WHEN TROUBLE SHOOTING AIR CUSHION RESTRAINT SYSTEM, DO NOT USE ELECTRICAL TEST EQUIPMENT, SUCH AS BATTERY POWERED OR A.C. POWERED VOLT METER, OHMMETER, ETC., OR ANY TYPE OF ELECTRICAL EQUIPMENT OTHER THAN SPECIFIED IN THIS MANUAL. DO NOT USE A NON-POWERED PROBE TYPE TESTER. INSTRUCTIONS IN THIS MANUAL SHOULD BE FOLLOWED CAREFULLY, OTHERWISE PERSONAL INJURY MAY RESULT.

1. With ignition switch in "LOCK" position and key removed, use connector extractor tool J-24388 or BT-7402A and separate 2-pin deployment ("A" buss) circuit connector from instrument panel car harness 6-pin connector (red connector located above sensor-recorder). Install deployment circuit substitute load (Fig. 1-13) onto 6-pin connector and ground to body. Turn ignition switch "ON" and observe operation of test lamps on "A" buss substitute load:

   NOTE: Deployment circuit is energized when ignition switch is in any position except "LOCK". Ignition key can be removed only from the "LOCK" position. When diagnosis operations are being performed requiring ignition switch in "LOCK", key should be removed to assure that ignition switch is in "LOCK" position. This also prevents other persons from rotating switch to another position.

   a. IF NEITHER SUSBSTITUTE LOAD BULB LIGHTS, check for open circuit in feed wire from feed source to connector (tan wire from source to fuse and tan/white wires from fuse to 6-pin red connector). Repair or replace wires as required to make both test bulbs light. With ignition switch in "LOCK" position, remove "A" buss substitute load and connect 2-pin connector to 6-pin (Red) connector. Then proceed to Step 4.

   b. IF ONLY ONE SUBSTITUTE LOAD BULB LIGHTS, check for open circuit in feed wires from 6-pin (Red) connector to fuse (tan/white wires). Repair or replace wires as required to make both test bulbs light. With ignition switch in "LOCK" position, remove "A" buss substitute load and connect 2-pin connector to 6-pin (Red) connector. Then proceed to Step 4.

   c. IF BOTH SUBSTITUTE LOAD BULBS LIGHT, turn ignition switch to "LOCK" and remove key. Remove deployment circuit "A" buss substitute load and connect 2-pin connector to instrument panel car harness 6-pin (Red) connector. Then proceed to Step 2.

2. With ignition switch in "LOCK" position and key removed, disconnect negative cable from battery and tape terminal end of cable.

WARNING: DO NOT ATTEMPT ANY SERVICING OR DISCONNECTING OF AIR CUSHION RESTRAIN SYSTEM COMPONENTS UNTIL NEGATIVE CABLE HAS BEEN DISCONNECTED FROM BATTERY AND TERMINAL END OF CABLE TAPED. THIS PROCEDURE MUST BE FOLLOWED TO PREVENT ACCIDENTAL DEPLOYMENT OF SYSTEM WHICH COULD RESULT IN PERSONAL INJURY AND/OR DAMAGE TO SYSTEM COMPONENTS. IN ADDITION, CARE MUST BE EXERCISED TO NEVER STRIKE SENSING MECHANISMS IN A MANNER WHICH COULD CAUSE INADVERTENT DEPLOYMENT OR IMPROPER OPERATION OF SYSTEM.

3. Remove sensor-recorder attaching screws and lower sensor for easier access to connectors (refer

to Section 2-Instrument Panel Components for sensor removal). Use connector extractor tool J-24388 or BT-7402A and disconnect recorder harness 4-pin connector from sensor- recorder (connector No. 4, Fig. 1-15). Reinstall sensor with one screw. Install screw with ring ground (Fig. 1-15). Connect battery, then turn ignition switch on and observe operation of Air Cushion Restraint System indicator lamp. IF LAMP DOES NOT LIGHT, proceed to Step 5. IF LAMP IS ON CONTINUOUSLY, check for following:

a. Short in Air Cushion Restraint System indicator lamp ground wire (Purple wire) from instrument panel car harness 6-pin (Red) connector to indicator lamp. IF SHORTED, disconnect battery (observe WARNING after Step 2) and repair or replace wire as required. Lower sensor- recorder and connect No. 4 connector to sensor-recorder (Fig. 1-15). Install sensor-recorder attaching bolts and torque to 57-87 inch pounds. Then connect battery and proceed to Step 4.

b. Short in Air Cushion Restraint System indicator lamp ground wire (Purple wire) from instrument panel car harness 6-pin (Red) connector to sensor-recorder (part of recorder harness). IF SHORTED, disconnect battery (observe WARNING after Step 2) and replace recorder harness as described in "Recorder Harness - Removal and Installation" procedure in Section 2-Instrument Panel Components. Then connect battery and proceed to Step 4.

4. Turn ignition switch "ON" and observe operation of Air Cushion Restraint System indicator lamp:

   a. IF INDICATOR LAMP LIGHTS WHEN IGNITION SWITCH IS FIRST TURNED ON AND GOES OUT AFTER 3-9 SECONDS, system is functioning properly.

   b. IF INDICATOR LAMP COMES ON AND REMAINS "ON CONTINUOUSLY", proceed to Step 5.

5. Check Air Cushion Restraint System analyzer (J-24628) lamps by plugging verification test lead (Fig. 1-10) into cigar lighter and performing analyzer lamp test No. 1 (Fig. 1-12):

   a. IF ALL THREE ANALYZER TEST LAMPS LIGHT, proceed to Step 6.

   b. IF ONE OR MORE OF TEST LAMPS DO NOT LIGHT, replace defective bulb(s) or repair analyzer as required. Remove verification test lead plug from cigar lighter.

   NOTE: Before connecting analyzer J-24628 into system, check all wire harness connectors to make sure problem is not caused by an improperly engaged connector.

6. With ignition switch in "LOCK" and key removed, disconnect negative cable from battery and tape terminal end of cable.

WARNING: DO NOT ATTEMPT ANY SERVICING OR DISCONNECTING OF AIR CUSHION RESTRAINT SYSTEM COMPONENTS UNTIL NEGATIVE CABLE HAS BEEN DISCONNECTED FROM BATTERY AND TERMINAL END OF CABLE TAPED. THIS PROCEDURE MUST BE FOLLOWED TO PREVENT ACCIDENTAL DEPLOYMENT OF SYSTEM WHICH COULD RESULT IN PERSONAL INJURY AND/OR DAMAGE TO SYSTEM COMPONENTS. IN ADDITION, CARE MUST BE EXERCISED TO NEVER STRIKE SENSING MECHANISMS IN A MANNER WHICH COULD CAUSE INADVERTENT DEPLOYMENT OR IMPROPER OPERATION OF SYSTEM.

7. Remove sensor-recorder attaching screws and lower sensor- recorder for easier access to harness connectors (as described in Section 2-Instrument Panel Components).

8. Connect Air Cushion Restraint System analyzer J-24628, with Air Cushion Restraint System as follows (Fig. 1-14):

   a. Using connector extractor tool J-24388 or BT-7402A (Fig. 1-10), disconnect all harness connectors from sensor-recorder.

   b. Connect analyzer 8-pin recorder connector (J1) to recorder.

   c. Connect analyzer 3-pin (J2), 8-pin (J3) and 4-pin (J4) connectors to sensor 15-pin connector.

   d. Connect harness connectors No. 2, 3 and 4 to analyzer 15-pin connector (P1).

   e. Connect 8-pin recorder harness connector No. 1 (White) to analyzer connector (P2).

9. Reinstall sensor-recorder with one screw. Install screw with the ring ground.

WARNING: CARE MUST BE EXERCISED TO NEVER STRIKE SENSING MECHANISMS IN A MANNER WHICH COULD CAUSE INADVERTENT DEPLOYMENT OR IMPROPER OPERATION OF SYSTEM, OTHERWISE PERSONAL INJURY MAY RESULT.

10. With analyzer switches in "OFF" position, connect negative cable to battery and turn ignition switch "ON".

    NOTE: After the Air Cushion Restraint System analyzer has been connected to the system, the entire checking procedure must be followed to the end even though a discrepancy has been detected in some part of the system. This is important due to the possibility of multiple discrepancies.

11. Perform analyzer test No. 3 and observe analyzer "A" buss (deployment circuit) power indicator lamp:

    a. IF "A" BUSS POWER INDICATOR LAMP LIGHTS, proceed to Step 12.

    b. IF "A" BUSS POWER INDICATOR LAMP DOES NOT LIGHT, replace passenger(s) harness as outlined in Section4-Passenger(s) Module. Then proceed to Step 12 to eliminate possibility of multiple problems in system.

12. Turn ignition switch to "LOCK", then "ON" and observe operation of Air Cushion Restraint System analyzer indicator lamp:

    a. IF ANALYZER INDICATOR LAMP COMES "ON" WHEN IGNITION SWITCH IS FIRST TURNED ON AND GOES OUT AFTER 3 TO 9 SECONDS, proceed to Step 13.

    b. IF ANALYZER INDICATOR LAMP COMES "ON" WHEN IGNITION SWITCH IS FIRST TURNED ON AND REMAINS "ON CONTINUOUSLY", replace sensor-recorder as outlined in Section 2-Instrument Panel Components. Then proceed to Step 13 to eliminate possibility of multiple problem in system.

13. Perform analyzer test No. 4 and observe operation of analyzer indicator lamp:

    a. IF ANALYZER INDICATOR LAMP DOES NOT COME ON, it indicates that bumper detector and harness are functioning normally.

    b. IF ANALYZER INDICATOR LAMP COMES ON AND STAYS ON, it indicates a malfunction in the bumper detector and harness circuit. Continue with testing procedure by performing Step 14.

    NOTE: If Air Cushion Restraint System analyzer indicator lamp lights momentarily (3-9 seconds) when switches 4, 5 and 6 are actuated to test position, this does not indicate a problem. Lamp must remain "On Continuously" to indicate a problem.

14. Perform driver module and harness test No. 5 and observe operation of analyzer indicator lamp:

    a. IF ANALYZER INDICATOR LAMP DOES NOT COME ON, it indicates that driver module and harness are functioning normally.

    b. IF ANALYZER INDICATOR LAMP COMES ON AND STAYS ON, it indicates a malfunction in the driver module and harness circuit. Continue with next step.

15. Perform passenger module and harness test No. 6 and observe operation of analyzer indicator lamp:

    a. IF ANALYZER INDICATOR LAMP DOES NOT COME ON, it indicates that passenger module and harness are functioning normally.

    b. IF ANALYZER INDICATOR LAMP COMES ON AND STAYS ON, it indicates a malfunction in the passenger(s) module and harness circuit.

    NOTE: If a problem is indicated in one or more circuits when performing Steps 13, 14 and 15, refer to procedure for Isolation Of Components In Circuits Where Problems Are Indicated By Analyzer.

Isolation of Components in Circuits Where Problems are Indicated by Analyzer

If one or more problems were detected when performing analyzer test 4, 5 and 6, all conditions can be isolated and corrected by performing operations outlined below to each malfunctioning circuit, one circuit at a time.

NOTE: If Air Cushion Restraint System in car indicator lamp comes on intermittently while driving the car, vehicle can be road tested with analyzer connected to the system. Except for road testing, diagnosis and correction procedure is the same as for an indicator lamp "On Continuously".

Also, when roadtesting with analyzer connected, all sensor attaching bolts must be installed and properly torqued to assure proper operation of system.

To isolate and correct problem(s) in circuits indicated by analyzer, turn ignition switch to "LOCK" and remove key. Disconnect negative cable from battery and tape terminal end of cable. Then select and perform appropriate circuit test listed below:

WARNING: DO NOT ATTEMPT ANY SERVICING OR DISCONNECTING OF AIR CUSHION RESTRAINT SYSTEM COMPONENTS UNTIL NEGATIVE CABLE HAS BEEN DISCONNECTED FROM BATTERY AND TERMINAL END OF CABLE TAPED. THIS PROCEDURE MUST BE FOLLOWED TO PREVENT ACCIDENTAL DEPLOYMENT OF SYSTEM WHICH COULD RESULT IN PERSONAL INJURY AND/OR DAMAGE TO SYSTEM COMPONENTS. IN ADDITION, CARE MUST BE EXERCISED TO NEVER STRIKE SENSING MECHANISMS IN A MANNER WHICH COULD CAUSE INADVERTENT DEPLOYMENT OR IMPROPER OPERATION OF SYSTEM.

1. BUMPER IMPULSE DETECTOR AND HARNESS CIRCUIT TEST (Analyzer Test Number 4) - Use connector extractor tool J-24388 or BT-7402A (Fig. 1- 10) and disconnect harness connector from bumper impulse detector. Install bumper impulse detector substitute load onto harness connector (Fig. 1-17) which is located in passenger compartment above parking brake.

   NOTE: Substitute load simulates a good component in the circuit being tested. When the analyzer test switch is actuated to the TEST position, the load will isolate the discrepancy as to either the component or the harness.

   Connect negative cable to battery and turn ignition switch "ON". Then perform analyzer test No. 4 and observe operation of analyzer indicator lamp:

   a. IF ANALYZER INDICATOR LAMP COMES ON AND STAYS ON, observe above WARNING and replace passenger Air Cushion Restraint System harness (refer to Section 4-Passenger(s) Module).

   b. IF ANALYZER INDICATOR LAMP DOES NOT COME ON, observe above WARNING and replace bumper impulse detector (refer to Section 3-Bumper).

2. DRIVER MODULE AND HARNESS CIRCUIT TEST (Analyzer Test Number 5) - Refer to Section 5-Driver Module and remove driver module from steering wheel. Use connector extractor tool J-24628-3 or BT-7405 (Fig. 1-18) and disconnect driver module connector.

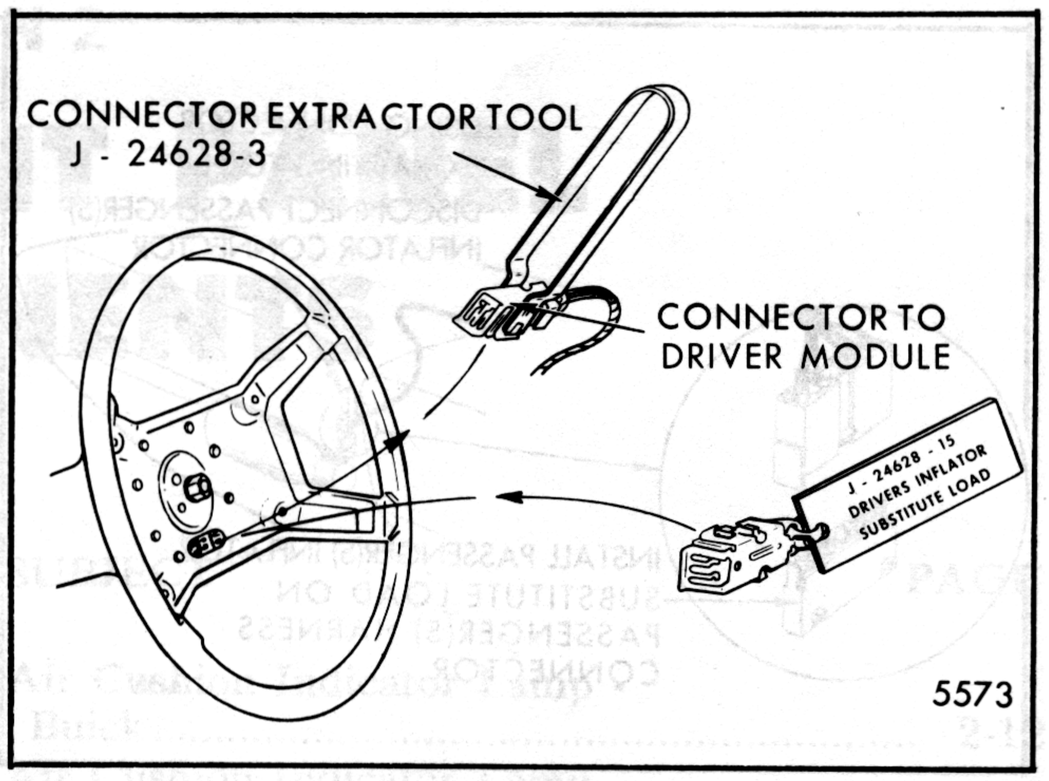

Fig. 1-18-Air Cushion Restraint System Indicator Lamp "On Continuously" Test - Driver Inflator Substitute Load Installation

Install driver inflator substitute load onto connector (Fig. 1-18). Then connect negative cable to battery and turn ignition switch "ON".

Perform analyzer test No. 5 and observe operation of analyzer indicator lamp:

a. IF ANALYZER INDICATOR LAMP COMES ON AND STAYS ON, observe above WARNING and replace driver harness (refer to Section 5-Driver Module).

NOTE: When a discrepancy has been isolated to the driver harness, slip ring resistance should be checked with tester J-24628-4. Replacement of the slip ring could possibly correct the problem without driver harness replacement.

b. IF ANALYZER INDICATOR LAMP DOES NOT COME ON, observe above WARNING and replace driver module (refer to Section 5-Driver Module).

3. PASSENGER(S) MODULE AND HARNESS CIRCUIT TEST (Analyzer Test Number 6) - Remove instrument panel pad on Oldsmobile and Cadillac (refer to Section 2-Instrument Panel Components) and glove box on Buick which will allow access to harness connector at passenger(s) inflator.

   Use connector extractor tool J-24388 or BT-7402A (Fig. 1-19) and disconnect harness connector from passenger(s) inflator. Install passenger(s) inflator substitute load onto harness connector (Fig. 1- 19).

   Connect negative cable to battery and turn ignition switch "ON". Then perform analyzer test

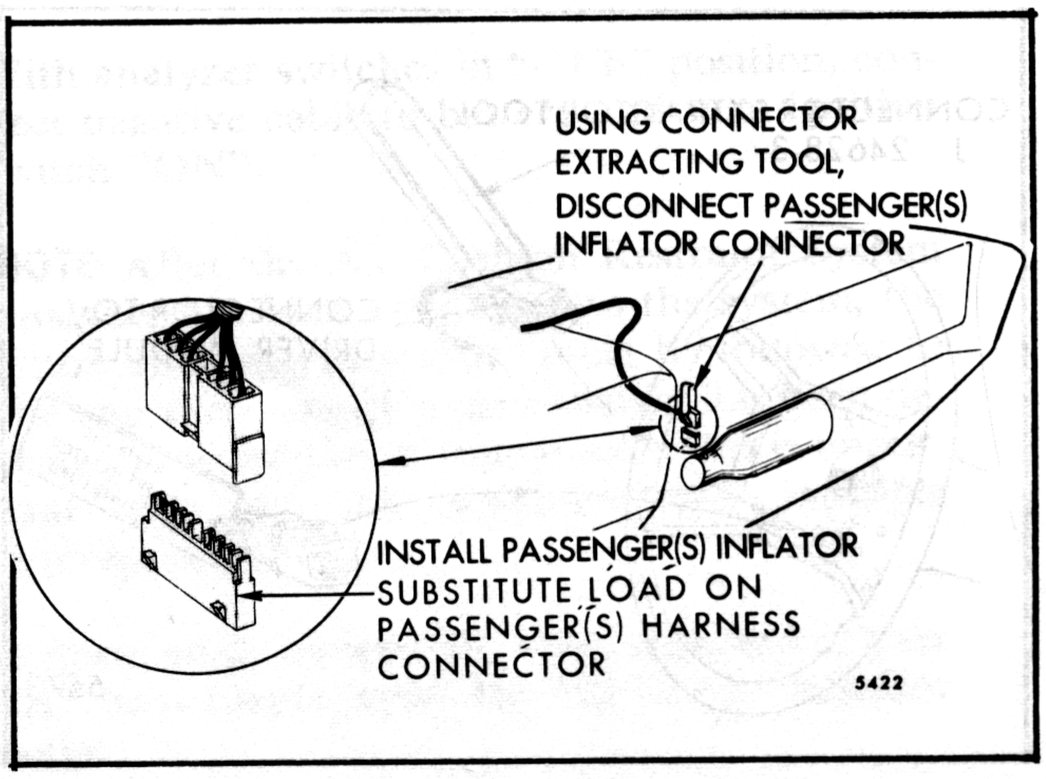
USING CONNECTOR EXTRACTING TOOL, DISCONNECT PASSENGER(S) INFLATOR CONNECTOR
INSTALL PASSENGER(S) INFLATOR SUBSTITUTE LOAD ON PASSENGER(S) HARNESS CONNECTOR
5422

Fig. 1-19-Air Cushion Restraint System Indicator Lamp "On Continuously" Test - Passenger(s) Inflator Substitute Load Installation

No. 6 and observe operation of analyzer indicator lamp:

a. IF ANALYZER INDICATOR LAMP COMES ON AND STAYS ON, observe above WARNING and replace passenger(s) Air Cushion Restraint System harness (refer to Section 4-Passenger(s) Module.

b. IF ANALYZER INDICATOR LAMP DOES NOT COME ON, observe above WARNING and replace passenger(s) module (refer to Section 4-Passenger(s) Moudle).

After all test have been completed, turn ignition switch to "LOCK" and remove key. Disconnect negative cable from battery and tape terminal end of cable. Then disconnect analyzer, replace all defective parts and install all previously removed parts. Torque sensor-recorder attaching bolts to 57-87 inch pounds.

Connect negative cable to battery and turn ignition switch "ON" and observe operation of Air Cushion Restraint System indicator lamp:

a. IF AIR CUSHION RESTRAINT SYSTEM IN CAR INDICATOR LAMP LIGHTS WHEN IGNITION SWITCH IS FIRST TURNED ON AND THEN GOES OUT AFTER 3-9 SECONDS, system is functioning properly.

b. IF AIR CUSHION RESTRAINT SYSTEM INDICATOR LAMP IN "ON CONTINUOUSLY", continue with diagnosis.

SECTION 2

INSTRUMENT PANEL COMPONENTS

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INSTRUMENT PANEL COMPONENTS

INTRODUCTION

NOTE: Anytime that modules are replaced due to cushion deployment, the sensor-recorder must also be replaced. If the modules have deployed due to collision, the bumper detector will require replacement along with any damaged harness assemblies in the system. All components in the system should be replaced if damaged, or carefully inspected, prior to connecting negative cable to battery after driver and-/or passenger module replacement.

WARNING: DO NOT ATTEMPT ANY SERVICING OR DISCONNECTING OF THE AIR CUSHION RESTRAINT SYSTEM INSTRUMENT PANEL, INSTRUMENT PANEL COMPONENTS OR ANY OTHER ELECTRICAL COMPONENTS IN THE ADJACENT AREA, UNTIL THE NEGATIVE CABLE HAS BEEN DISCONNECTED FROM THE BATTERY AND THE TERMINAL END OF THE CABLE TAPED. THIS PROCEDURE MUST BE FOLLOWED TO PREVENT ACCIDENTAL DEPLOYMENT OF THE SYSTEM WHICH COULD RESULT IN PERSONAL INJURY AND/OR DAMAGE TO THE SYSTEM COMPONENTS.

KNEE RESTRAINT - Oldsmobile (Refer to Figs. 2-1 and 2-2)

Removal and Installation

1. Turn ignition switch to "LOCK" position. Disconnect the negative cable from the battery and tape end.
2. Slide collar (on steering column) up column so that knee restraint cover can be removed.
3. Remove screw from left side of cover, then grip cover firmly and pull cover from the eight retaining clips (Fig. 2-1).
4. Remove screws from right and left lower edges of restraint (Fig. 2-1).
5. Remove two screws from restraint to restraint brace.
6. Remove two screws (left front), three screws (right front) from knee restraint to tie bar.
7. Remove screw from wiring harness ground to tie bar.

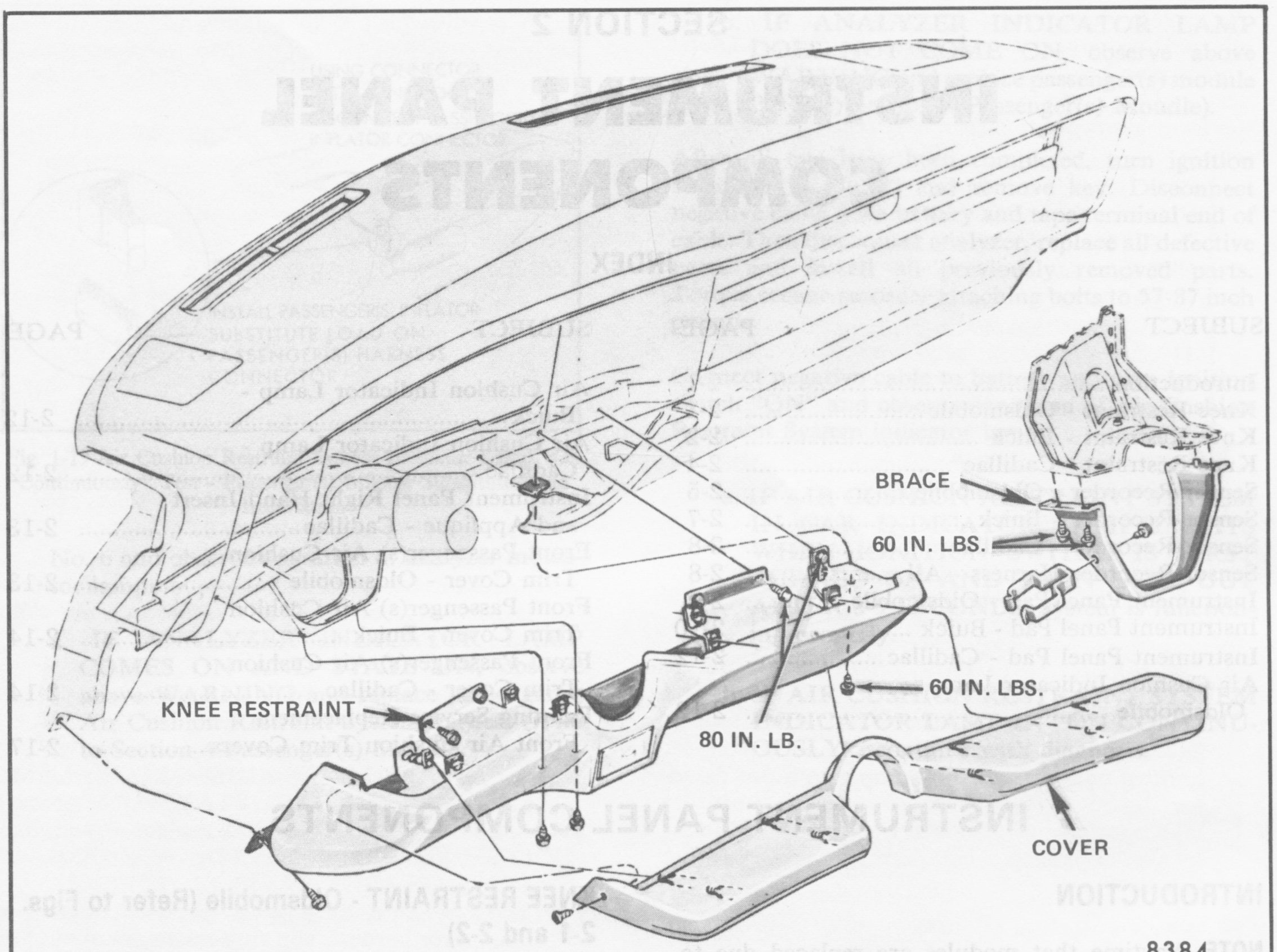

Fig. 2-1-Knee Restraint and Cover - Oldsmobile

8. Remove screw from left hand courtesy lamp.

9. Disconnect transmission downshift switch connector.

10. Lower knee restraint to disconnect lower left air conditioning hose and parking brake cable at parking brake and remove knee restraint (Fig. 2-2).

11. To install, reverse removal procedures making certain screws are torqued to 60 inch pounds.

KNEE RESTRAINT - Buick (Refer to Fig. 2-3)

Removal and Installation

1. Turn ignition switch to "LOCK" position. Disconnect the negative cable from battery and tape end.

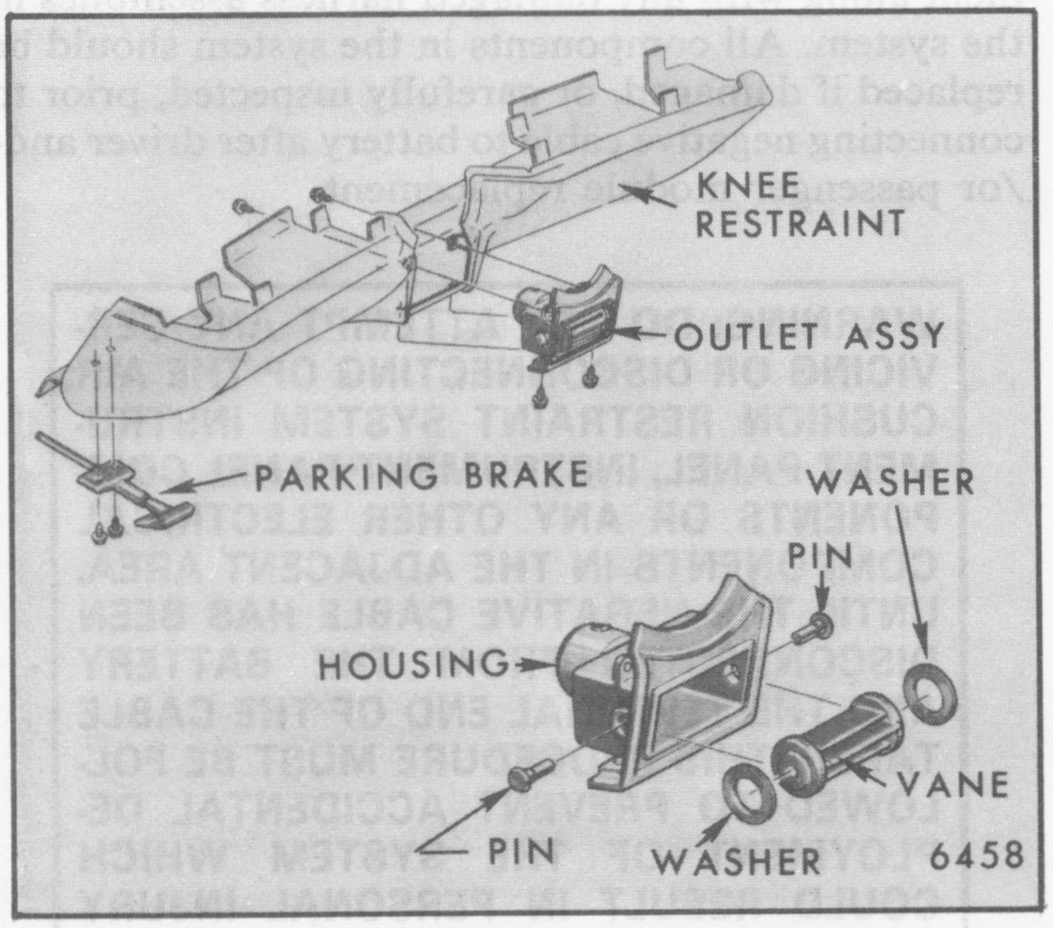

Fig. 2-2-Knee Restraint and Air Condition Outlet - Oldsmobile

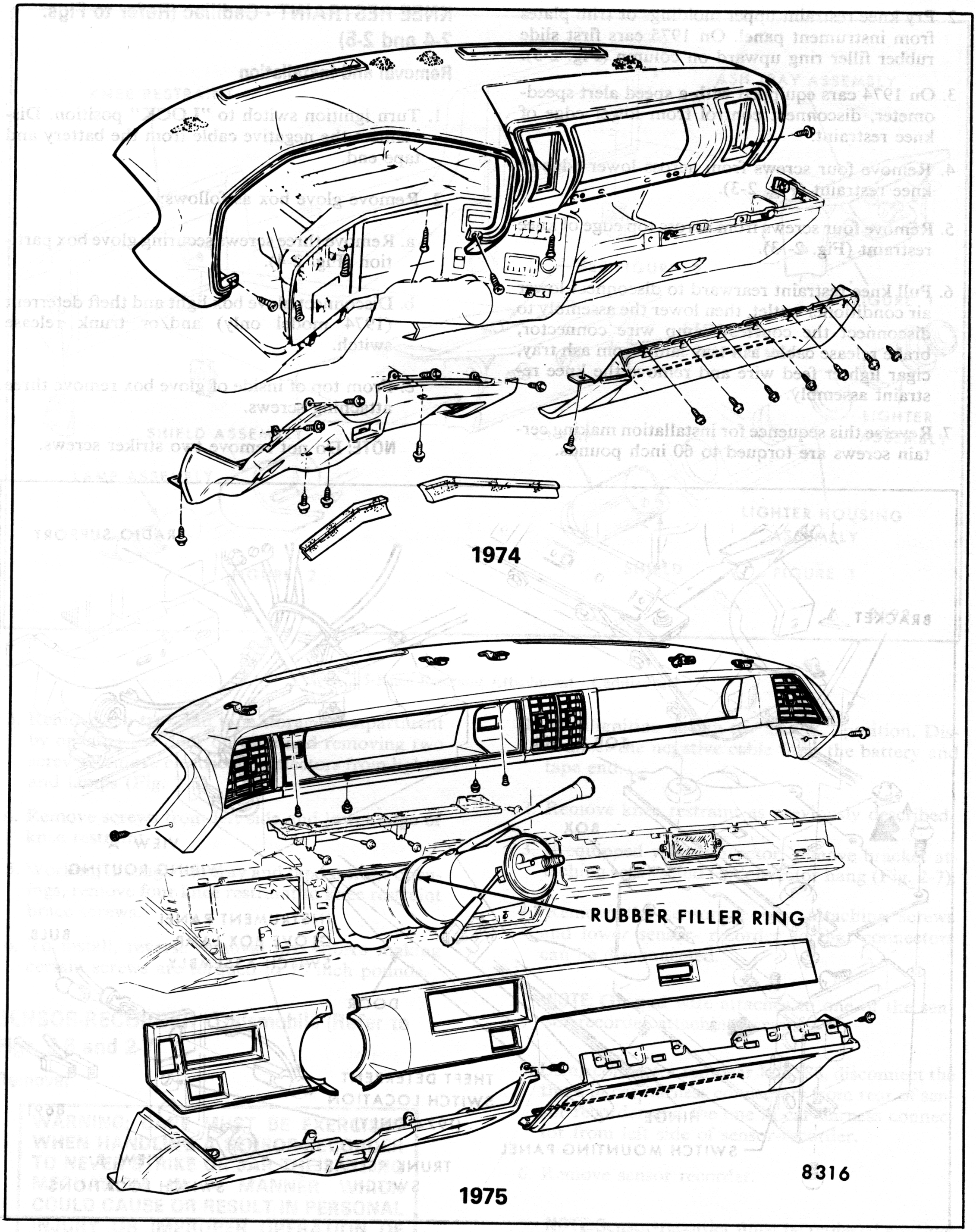

Fig. 2-3-Driver Knee Restraint and Upper Molding Installation - Buick

2. Pry knee restraint upper moldings or trim plates from instrument panel. On 1975 cars first slide rubber filler ring upward on column (Fig. 2-3).

3. On 1974 cars equipped with a speed alert speedometer, disconnect control from lower edge of knee restraint.

4. Remove four screws from across lower edge of knee restraint (Fig. 2-3).

5. Remove four screws from across top edge of knee restraint (Fig. 2- 3).

6. Pull knee restraint rearward to disconnect lower air conditioner outlet, then lower the assembly to disconnect the courtesy lamp wire connector, brake release cable, ash tray lamp from ash tray, cigar lighter feed wire and remove the knee restraint assembly.

7. Reverse this sequence for installation making certain screws are torqued to 60 inch pounds.

KNEE RESTRAINT - Cadillac (Refer to Figs. 2-4 and 2-5)

Removal and Installation

1. Turn ignition switch to "LOCK" position. Disconnect the negative cable from the battery and tape end.

2. Remove glove box as follows:

a. Remove three screws securing glove box partition (Fig. 2-4).

b. Disconnect glove box light and theft deterrent (1974 model only) and/or trunk release switch.

c. From top of inside of glove box remove three attaching screws.

NOTE: Do not remove two striker screws.

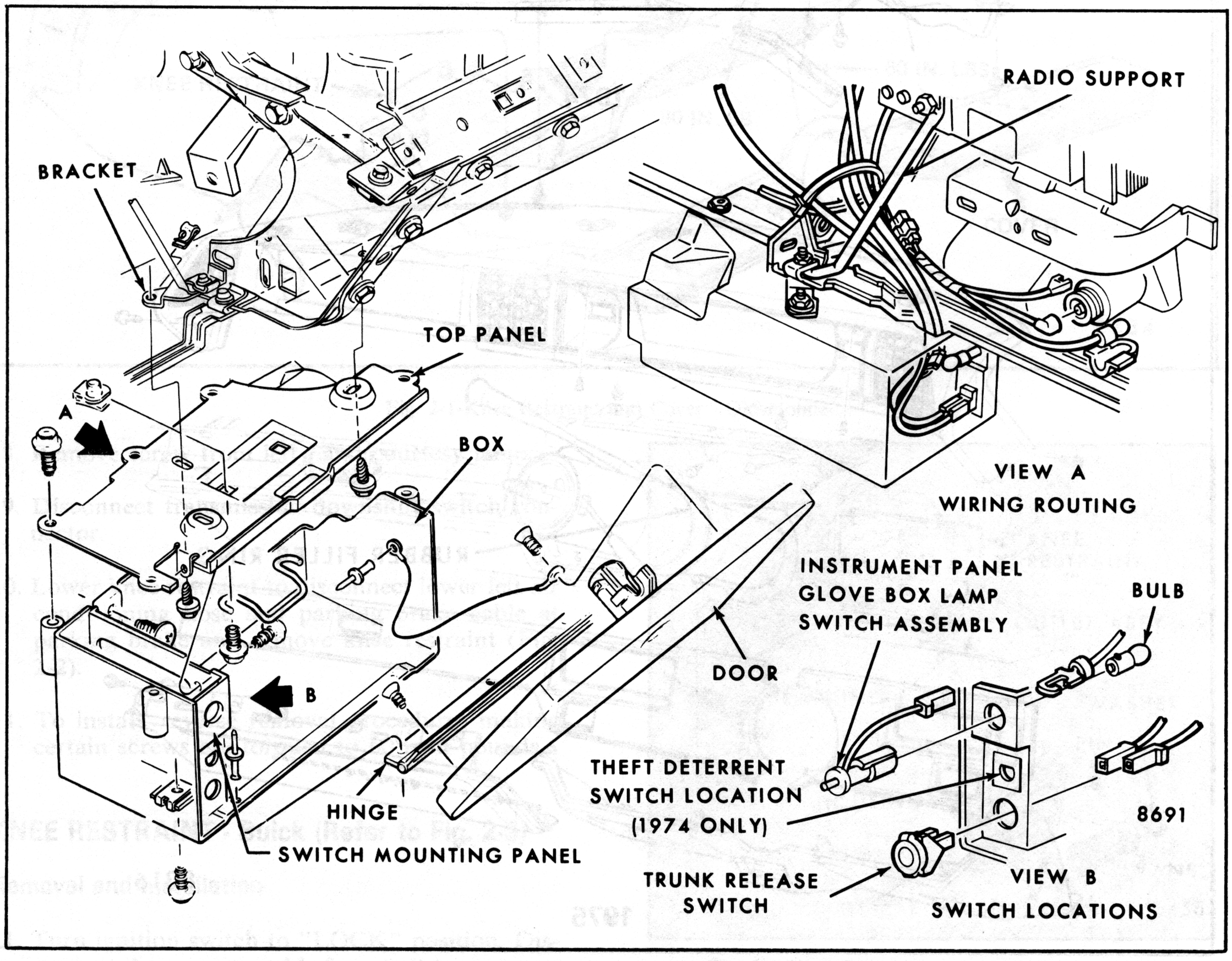

Fig. 2-4-Glove Box Attachment - Cadillac

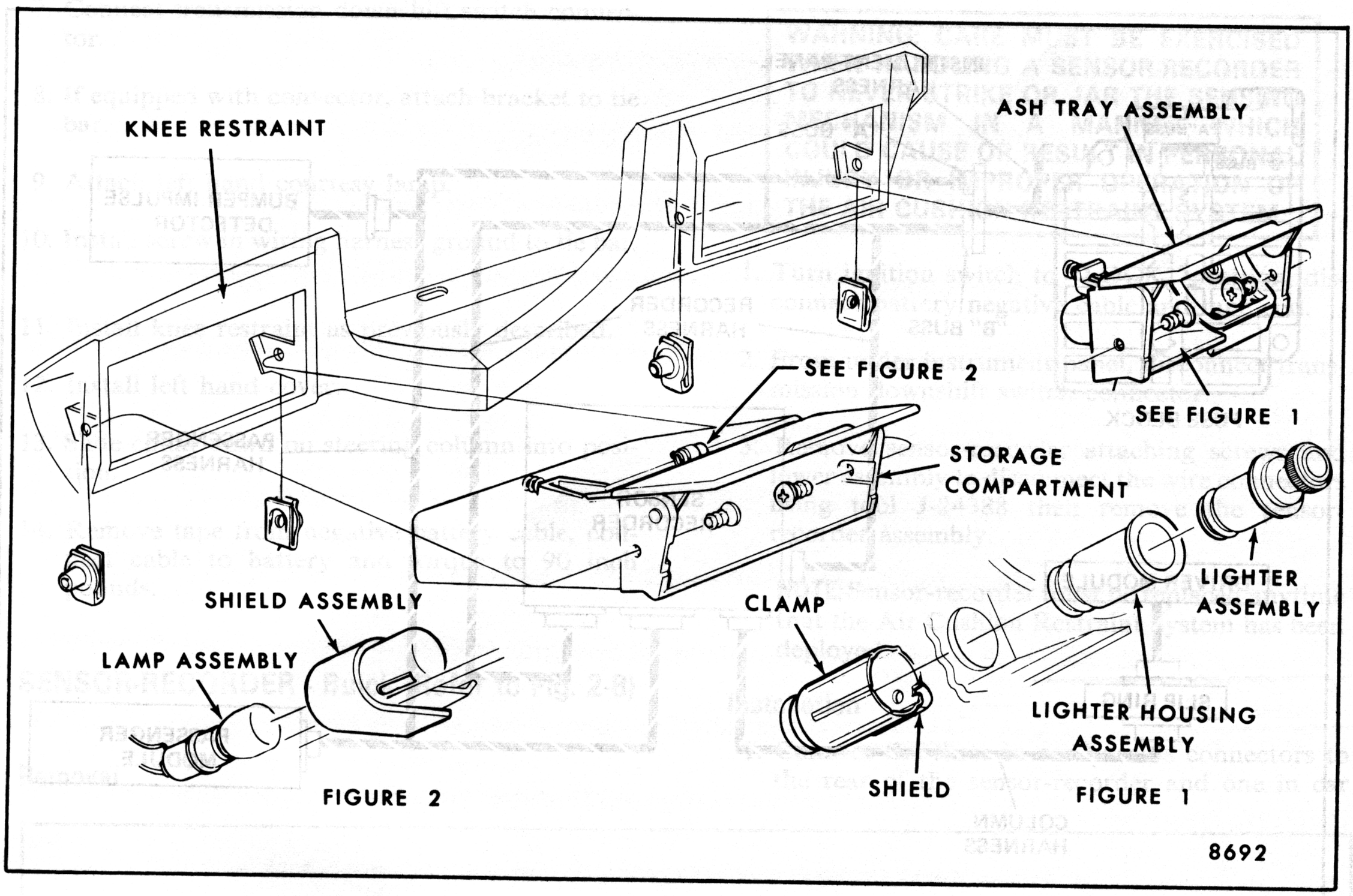

Fig. 2-5-Knee Restraint Attachment - Cadillac

3. Remove ash tray and tape storage compartment by opening the door on each and removing two screws.Remove electrical connectors from lighter and lamps (Fig. 2-5).
4. Remove screws from left side and lower edge of knee restraint.
5. Working through ash tray and tape storage openings, remove four knee restraint to knee restraint brace screws.
6. To install, reverse removal procedures making certain screws are torqued to 75 inch pounds.

SENSOR-RECORDER - Oldsmobile (Refer to Figs. 2-6 and 2-7

Removal

WARNING: CARE MUST BE EXERCISED WHEN HANDLING A SENSOR-RECORDER TO NEVER STRIKE OR JAR THE SENSING MECHANISM IN A MANNER WHICH COULD CAUSE OR RESULT IN PERSONAL INJURY OR IMPROPER OPERATION OF THE AIR CUSHION RESTRAINT SYSTEM.

1. Turn ignition switch to "LOCK" position. Disconnect the negative cable from the battery and tape end.
2. Remove knee restraint as previously described.
3. If equipped with convector, remove bracket attaching screws and let convector hang (Fig. 2-7).
4. Remove the sensor-recorder attaching screws and lower sensor- recorder so that connectors can be disconnected.

NOTE: Ground wire attaches to one of the sensor-recorder attaching screws.

5. Using connector remover J-24388, disconnect the three in car harness connectors from rear of sensor-recorder and the one in car harness connector from left side of sensor-recorder.
6. Remove sensor recorder.

NOTE: Sensor-recorder must be replaced anytime that the Air Cushion Restraint System has been deployed.

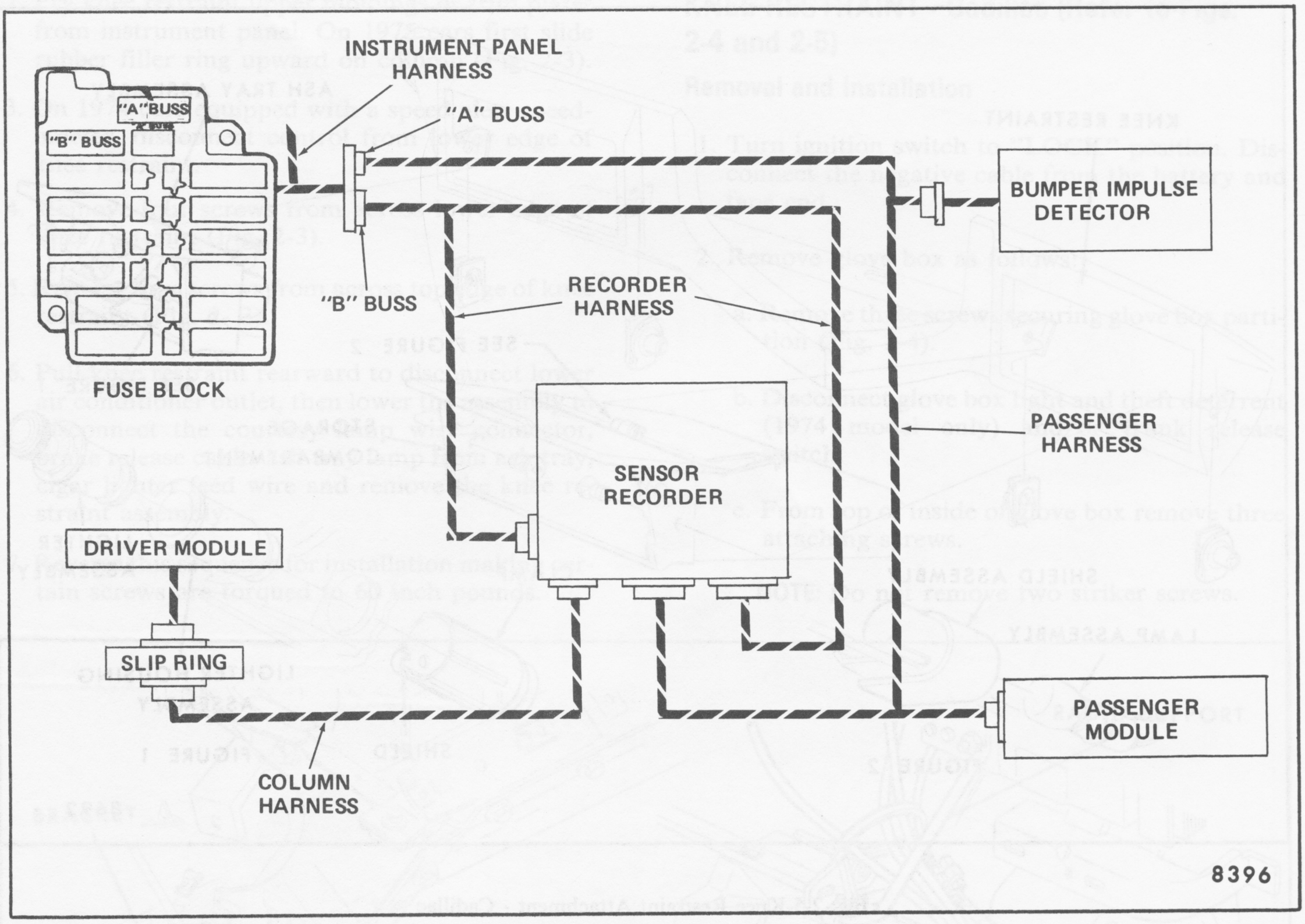

Fig. 2-6-Air Cushion Restraint Wiring Harness - Oldsmobile

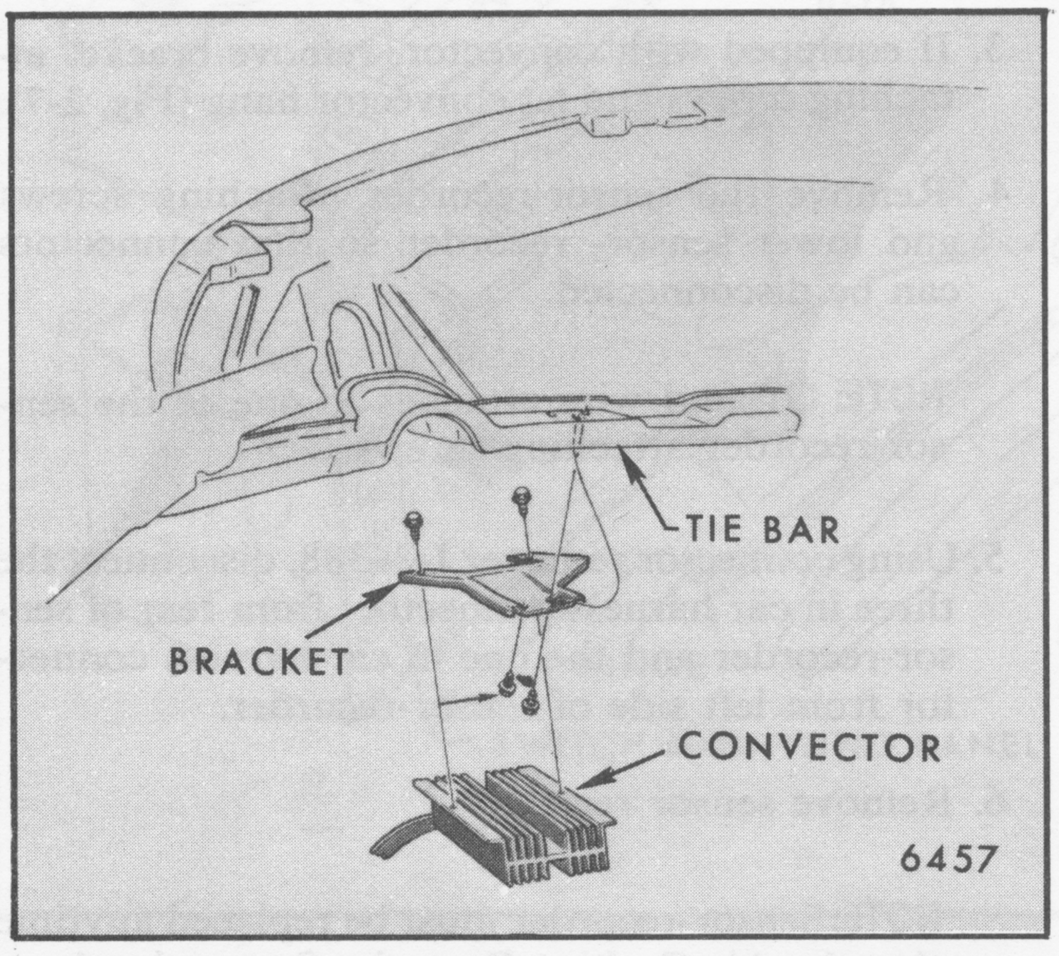

Fig. 2-7-Convector Attachment - Oldsmobile

Installation

1. Connect the three in car harness connectors to the rear of sensor-recorder and one in car harness connector to the left side of the sensor-recorder.
2. Install sensor-recorder to mounting bracket, make sure ground wire is attached to one of the screws and torque screws to 57-87 inch pounds.
3. Remove tape from negative battery cable, connect cable to battery and torque to 90 inch pounds.
4. Rotate ignition switch to any position but "LOCK".
5. Observe indicator lamp. If okay, proceed to Step 6, if not, connect analyzer for diagnosis.
6. Turn ignition switch to "LOCK" position. Disconnect the negative cable from the battery and tape end.

7. Connect transmission downshift switch connector.
8. If equipped with convector, attach bracket to tie bar.
9. Attach left hand courtesy lamp.
10. Install screw in wiring harness ground to tie bar.
11. Install knee restraint as previously described.
12. Install left hand cover.
13. Slide collar down on steering column into position.
14. Remove tape from negative battery cable, connect cable to battery and torque to 90 inch pounds.

SENSOR-RECORDER - Buick (Refer to Fig. 2-8)

Removal

WARNING: CARE MUST BE EXERCISED WHEN HANDLING A SENSOR-RECORDER TO NEVER STRIKE OR JAR THE SENSING MECHANISM IN A MANNER WHICH COULD CAUSE OR RESULT IN PERSONAL INJURY OR IMPROPER OPERATION OF THE AIR CUSHION RESTRAINT SYSTEM.

1. Turn ignition switch to "LOCK" position, disconnect battery negative cable and tape end.
2. From under instrument panel, disconnect transmission downshift switch connector.
3. Remove sensor-recorder attaching screws and lower assembly to disconnect the wire connectors using tool J-24388 then remove the sensor-recorder assembly.

NOTE: Sensor-recorder must be replaced anytime that the Air Cushion Restraint System has been deployed.

Installation

1. Connect the three in car harness connectors to the rear of the sensor-recorder and one in car

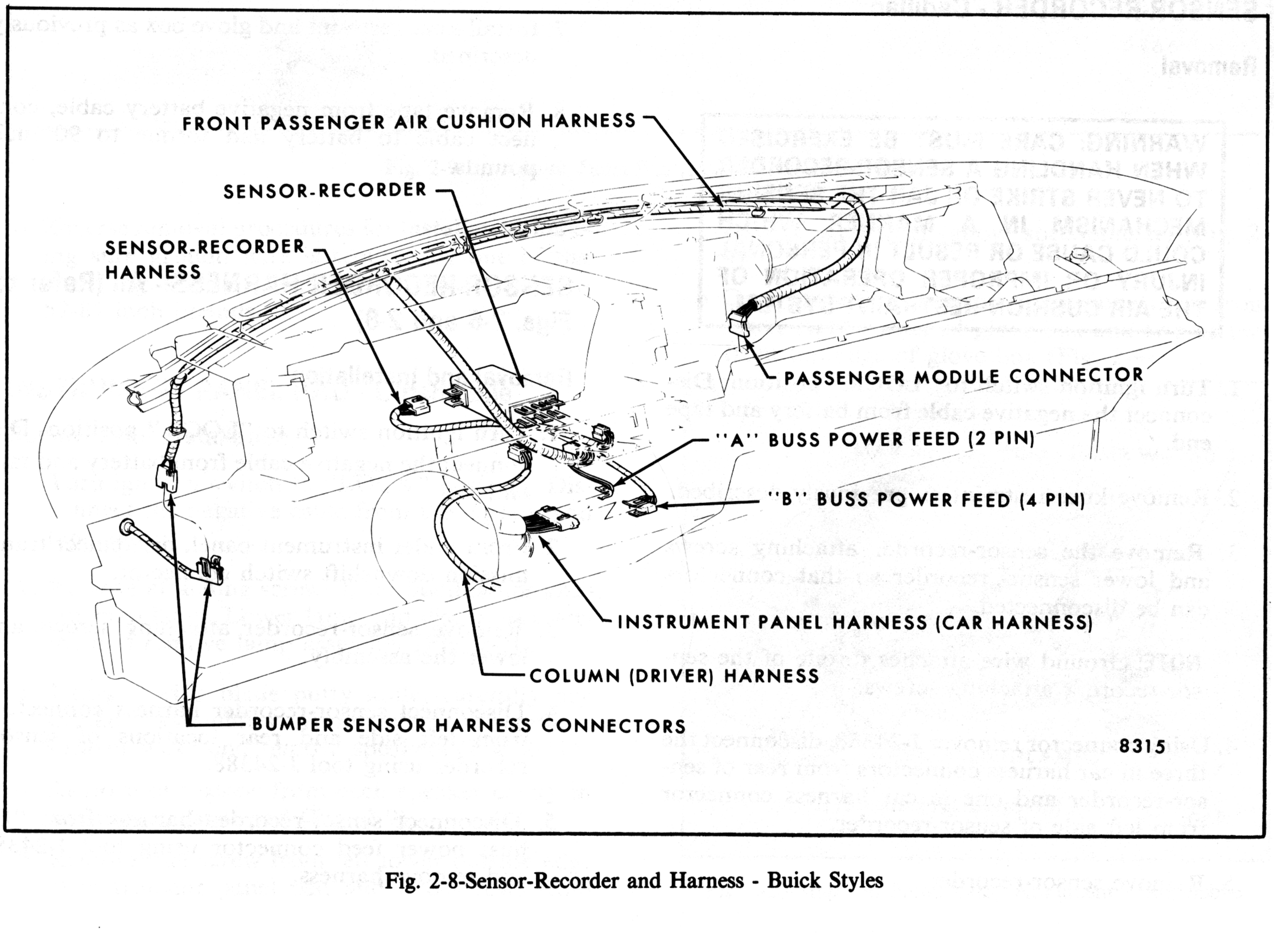

Fig. 2-8-Sensor-Recorder and Harness - Buick Styles

harness connector to the left side of the sensor-recorder.

2. Install sensor-recorder making sure ground wire is attached to one of the screws and torque screws to 57-87 inch pounds.

3. Remove tape from negative battery cable, connect cable to battery and torque to 90 inch pounds.

4. Turn ignition switch to a position other than "LOCK".

5. Observe indicator lamp. If okay, proceed to Step 6, if not, connect analyzer for diagnosis.

6. Turn ignition switch to "LOCK" position. Disconnect negative battery cable and tape end.

7. Connect transmission downshift switch connector.

8. Remove tape from negative battery cable, connect cable to battery and torque to 90 inch pounds.

SENSOR-RECORDER - Cadillac

Removal

WARNING: CARE MUST BE EXERCISED WHEN HANDLING A SENSOR-RECORDER TO NEVER STRIKE OR JAR THE SENSING MECHANISM IN A MANNER WHICH COULD CAUSE OR RESULT IN PERSONAL INJURY OR IMPROPER OPERATION OF THE AIR CUSHION RESTRAINT SYSTEM.

1. Turn ignition switch to "LOCK" position. Disconnect the negative cable from battery and tape end.

2. Remove knee restraint as previously described.

3. Remove the sensor-recorder attaching screws and lower sensor- recorder so that connectors can be disconnected.

   NOTE: Ground wire attaches to one of the sensor-recorder attaching screws.

4. Using connector remover J-24388, disconnect the three in car harness connectors from rear of sensor-recorder and one in car harness connector from left side of sensor-recorder.

5. Remove sensor-recorder.

   NOTE: Sensor-recorder must be replaced anytime that the air cushion restraint system has been deployed.

Installation

1. Connect the three in car harness connectors to the rear of sensor-recorder and one in car harness connector to the left side of the sensor-recorder.

2. Install sensor-recorder to mounting bracket, make sure ground wire is attached to one of the screws and torque screws to 57-87 inch pounds.

3. Remove tape from negative battery cable, connect cable to battery and torque to 90 inch pounds.

4. Rotate ignition switch to any position but "LOCK".

5. Observe indicator lamp. If okay, proceed to Step 6, if not, connect analyzer for diagnosis.

6. Turn ignition switch to "LOCK" position. Disconnect the negative cable from the battery and tape end.

7. Install knee restraint and glove box as previously described.

8. Remove tape from negative battery cable, connect cable to battery and torque to 90 inch pounds.

SENSOR-RECORDER HARNESS - All (Refer to Figs. 2-6 and 2-8)

Removal and Installation

1. Turn ignition switch to "LOCK" position. Disconnect the negative cable from battery and tape end.

2. From under instrument panel, disconnect transmission downshift switch connector.

3. Remove sensor-recorder attaching screws and lower the assembly.

4. Disconnect sensor-recorder harness connectors from left side and rear locations of sensor-recorder using tool J-24388.

5. Disconnect sensor-recorder harness from "B" buss power feed connector using tool J-24388 and remove harness.

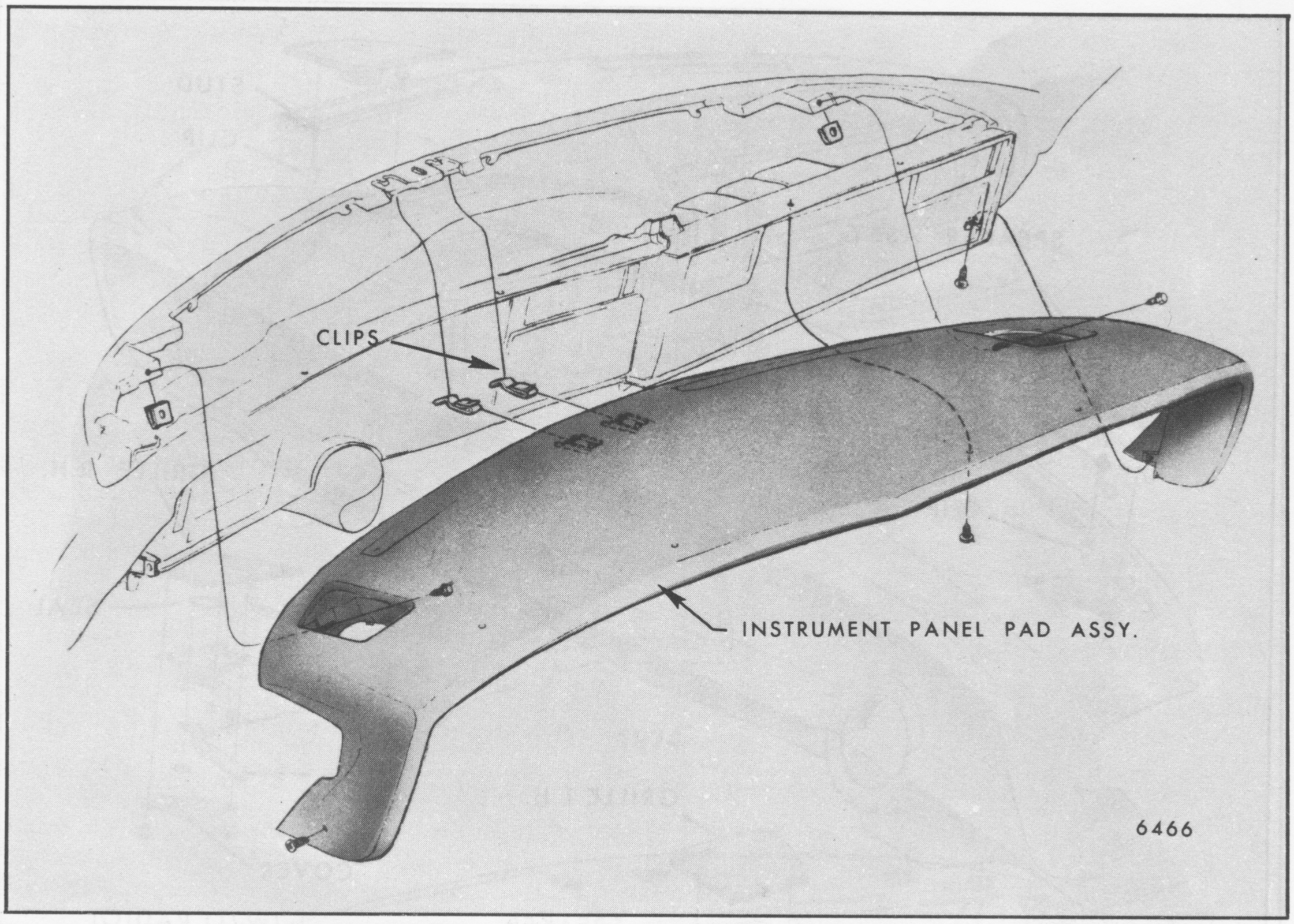

Fig. 2-9-Instrument Panel Pad Assembly - Oldsmobile

6. Reverse removal procedures for installation making sure ground wire is secured by one of the attaching screws which are to be torqued to 57-87 inch pounds.

INSTRUMENT PANEL PAD - Oldsmobile

Removal and Installation

1. Turn ignition switch to "LOCK" position. Disconnect the negative cable from the battery and tape end.
2. Remove attaching screws from flood lamps and/or map lamp. Lower lamp and disconnect wiring and remove lamp assembly (Fig. 2-10).
3. Using a wide blade putty knife, carefully pry speaker assemblies from clips, disconnect speaker wires and remove speakers (Fig. 2-11).
4. Remove one screw from each speaker cavity in instrument panel pad (Fig. 2-9).
5. Remove one screw from left lower outside edge of instrument panel pad and two screws from instrument cluster (above speedometer) (Fig. 2-9).
6. Open glove box door and remove one screw from lower right corner of glove box and two screws from top edge of glove box (Fig. 2-9).

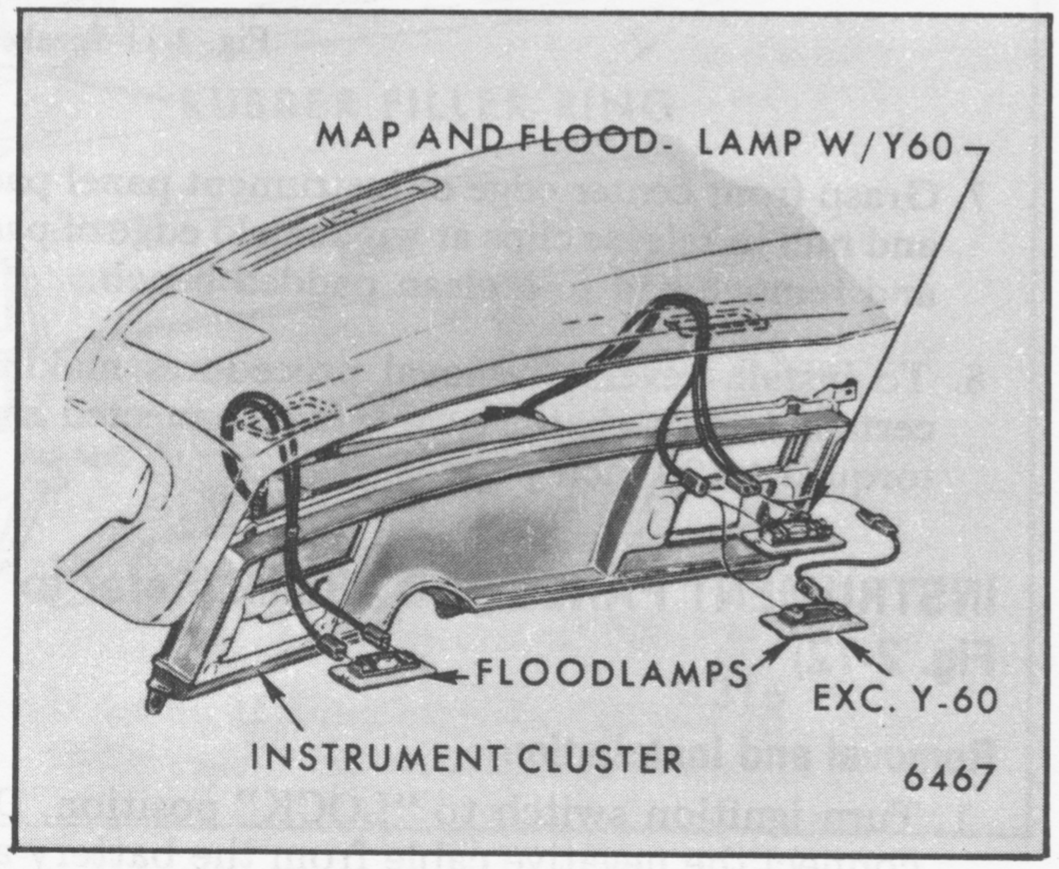

Fig. 2-10-Map and Flood Lamp Attchment - Oldsmobile

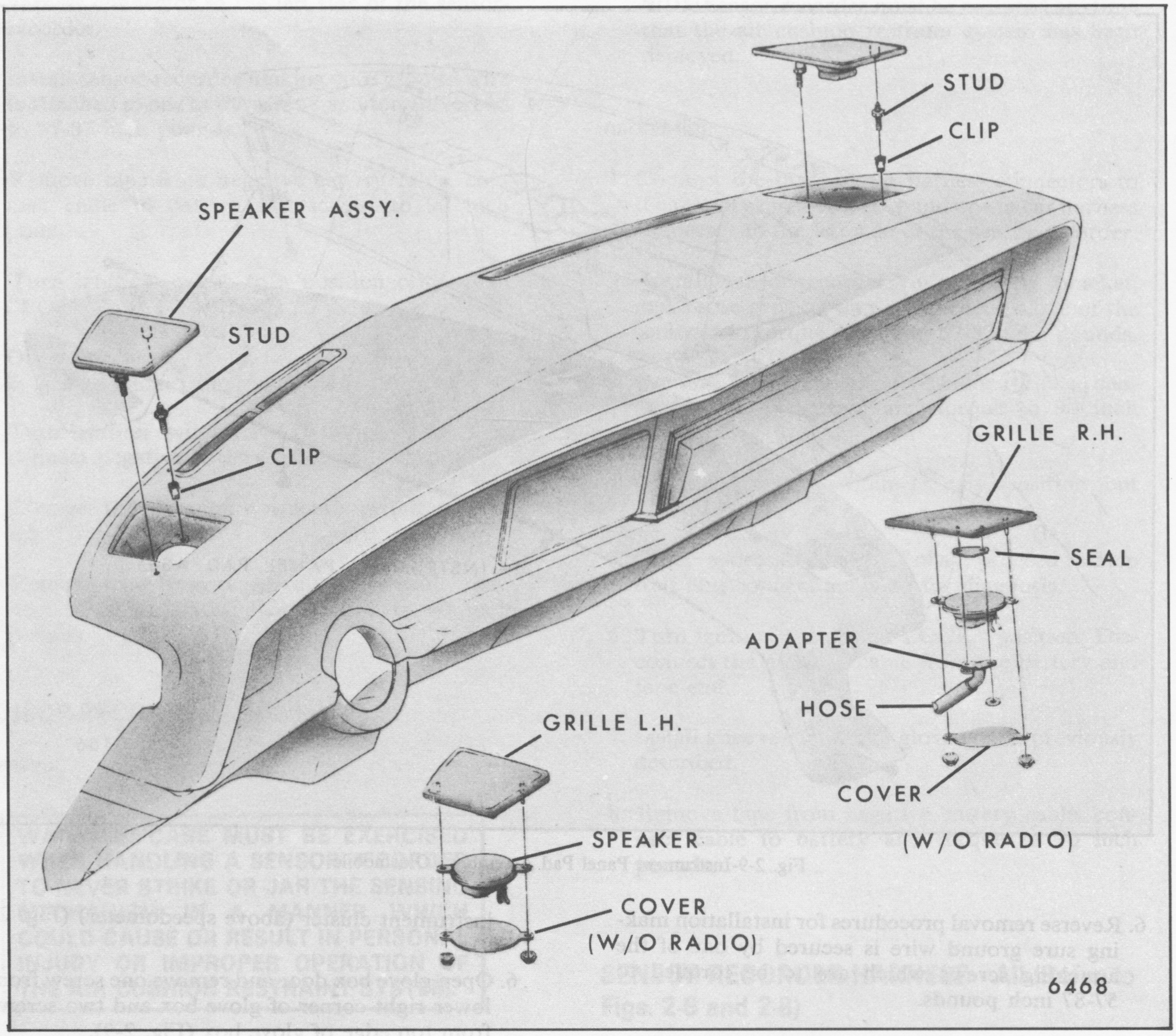

Fig. 2-11-Speaker Attachment - Oldsmobile

7. Grasp front center edge of instrument panel pad and pull to release clips at windshield edge of pad and remove pad to a clean padded bench.

8. To install, reverse removal procedures making certain negative battery cable is reconnected and torqued to 90 inch pounds.

INSTRUMENT PANEL PAD - Buick (Refer to Fig. 2-12)

Removal and Installation

1. Turn ignition switch to "LOCK" position. Disconnect the negative cable from the battery and tape end.

2. Remove retaining screws and glove box door.

3. Remove retaining screws and glove box.

4. Disconnect glove box light.

5. Remove screws retaining instrument panel pad (see Fig. 2-12).

6. Reach through glove box opening and release right instrument panel cover to cowl clip.

7. Pull cover rearward and disconnect air conditioning outlet hoses.

8. Disconnect speaker wire connector.

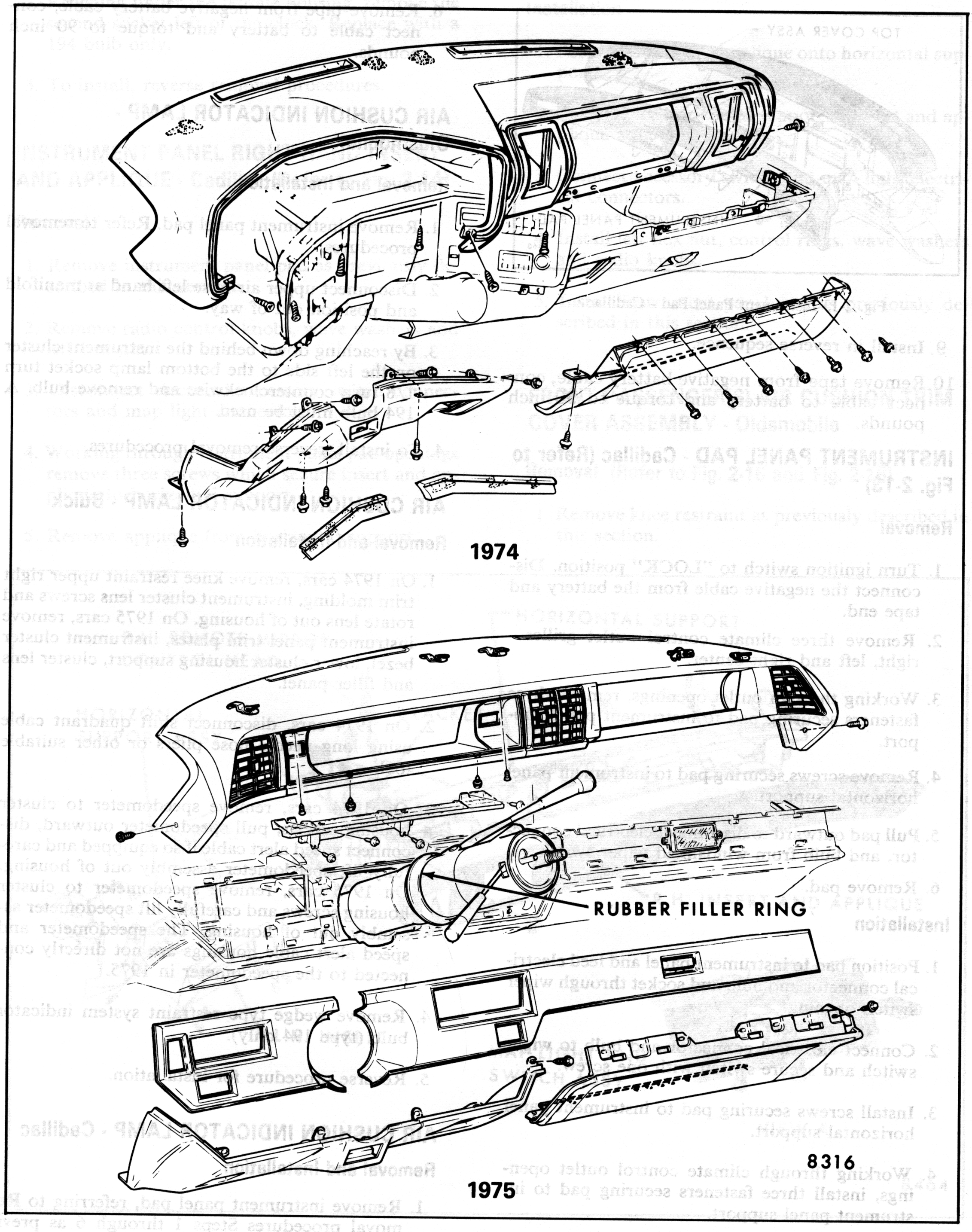

Fig. 2-12-Instrument Panel Pad - Buick Styles

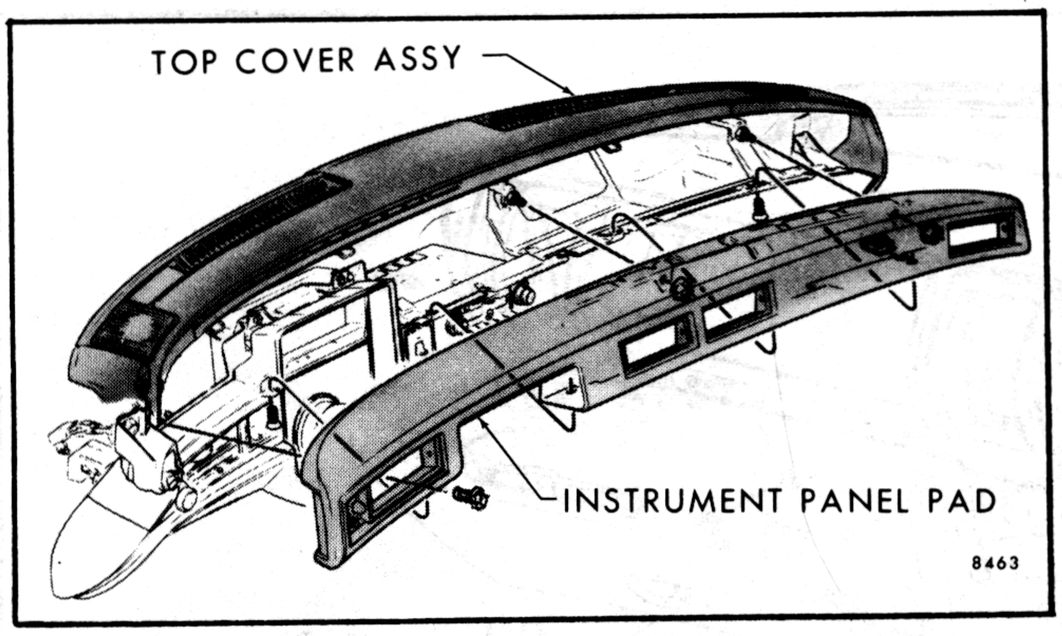

Fig. 2-13-Instrument Panel Pad - Cadillac

9. Install in reverse sequence.
10. Remove tape from negative battery cable, connect cable to battery and torque to 90 inch pounds.

INSTRUMENT PANEL PAD - Cadillac (Refer to Fig. 2-13)

Removal

1. Turn ignition switch to "LOCK" position. Disconnect the negative cable from the battery and tape end.
2. Remove three climate control outlet grilles - right, left and right center.
3. Working through outlet openings, remove three fasteners securing pad to instrument panel support.
4. Remove screws securing pad to instrument panel horizontal support.
5. Pull pad outward to disconnect electrical connector, and bulb from windshield wiper switch.
6. Remove pad.

Installation

1. Position pad to instrument panel and feed electrical connector and bulb and socket through wiper switch opening.
2. Connect electrical connector and bulb to wiper switch and secure switch with one screw.
3. Install screws securing pad to instrument panel horizontal support.
4. Working through climate control outlet openings, install three fasteners securing pad to instrument panel support.
5. Install air outlet grilles.
6. Remove tape from negative battery cable, connect cable to battery and torque to 90 inch pounds.

AIR CUSHION INDICATOR LAMP - Oldsmobile

Removal and Installation

1. Remove instrument panel pad. Refer to removal procedures.
2. Disconnect upper air hose left hand at manifold and position out of way.
3. By reaching down behind the instrument cluster on the left side to the bottom lamp socket turn 1/8 turn counterclockwise and remove bulb. A 194 bulb must be used.
4. To install, reverse removal procedures.

AIR CUSHION INDICATOR LAMP - Buick

Removal and Installation

1. On 1974 cars, remove knee restraint upper right trim molding, instrument cluster lens screws and rotate lens out of housing. On 1975 cars, remove instrument panel trim plates, instrument cluster bezel, lower cluster housing support, cluster lens and filler panel.
2. On 1974 cars, disconnect shift quadrant cable using long needle nose pliers or other suitable tool.
3. On 1974 cars, remove speedometer to cluster housing screws, pull speedometer outward, disconnect speed alert cable if so equipped and carefully lift speedometer assembly out of housing. On 1975 cars, remove speedometer to cluster housing screws and carefully lift speedometer assembly out of housing. The speedometer and speed alert cable housings are not directly connected to the speedometer in 1975.
4. Remove wedge type restraint system indicator bulb (type 194 only).
5. Reverse procedure for installation.

AIR CUSHION INDICATOR LAMP - Cadillac

Removal and Installation

1. Remove instrument panel pad, referring to Removal procedures Steps 1 through 6 as previously described in this section.

2. Reaching under the telltale housing, remove the second socket left of the clock. Replace with a 194 bulb only.

3. To install, reverse removal procedures.

INSTRUMENT PANEL RIGHT HAND INSERT AND APPLIQUE - Cadillac (Refer to Fig. 2-14)

Removal

1. Remove instrument panel pad as previously described in this section.

2. Remove radio control knobs, wave washers and left hex nut.

3. Disconnect electrical accessory switch connectors and map light connector.

4. Working through instrument panel pad openings remove three screws which secure insert and applique to horizontal support.

5. Remove applique from horizontal support.

Installation

1. Position insert and applique onto horizontal support.

2. Install three horizontal support to insert and applique attaching screws.

3. Connect accessory switch and map light electrical connectors.

4. Install left hex nut, control rings, wave washers and radio knobs.

5. Install instrument panel pad as previously described in this section.

FRONT PASSENGER(S) AIR CUSHION TRIM COVER ASSEMBLY - Oldsmobile

Removal (Refer to Fig. 2-15 and Fig. 2-16)

1. Remove knee restraint as previously described in this section.

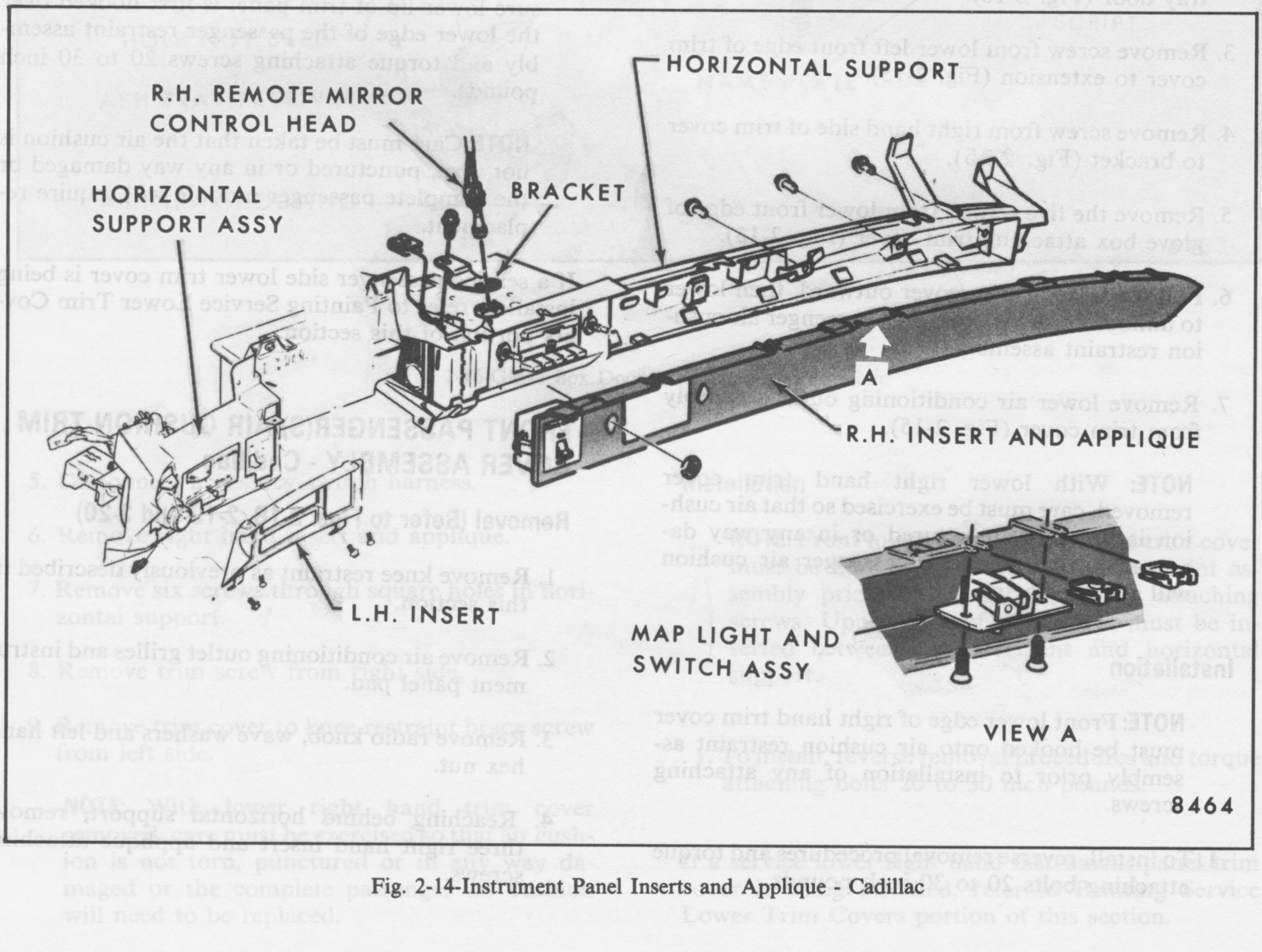

Fig. 2-14-Instrument Panel Inserts and Applique - Cadillac

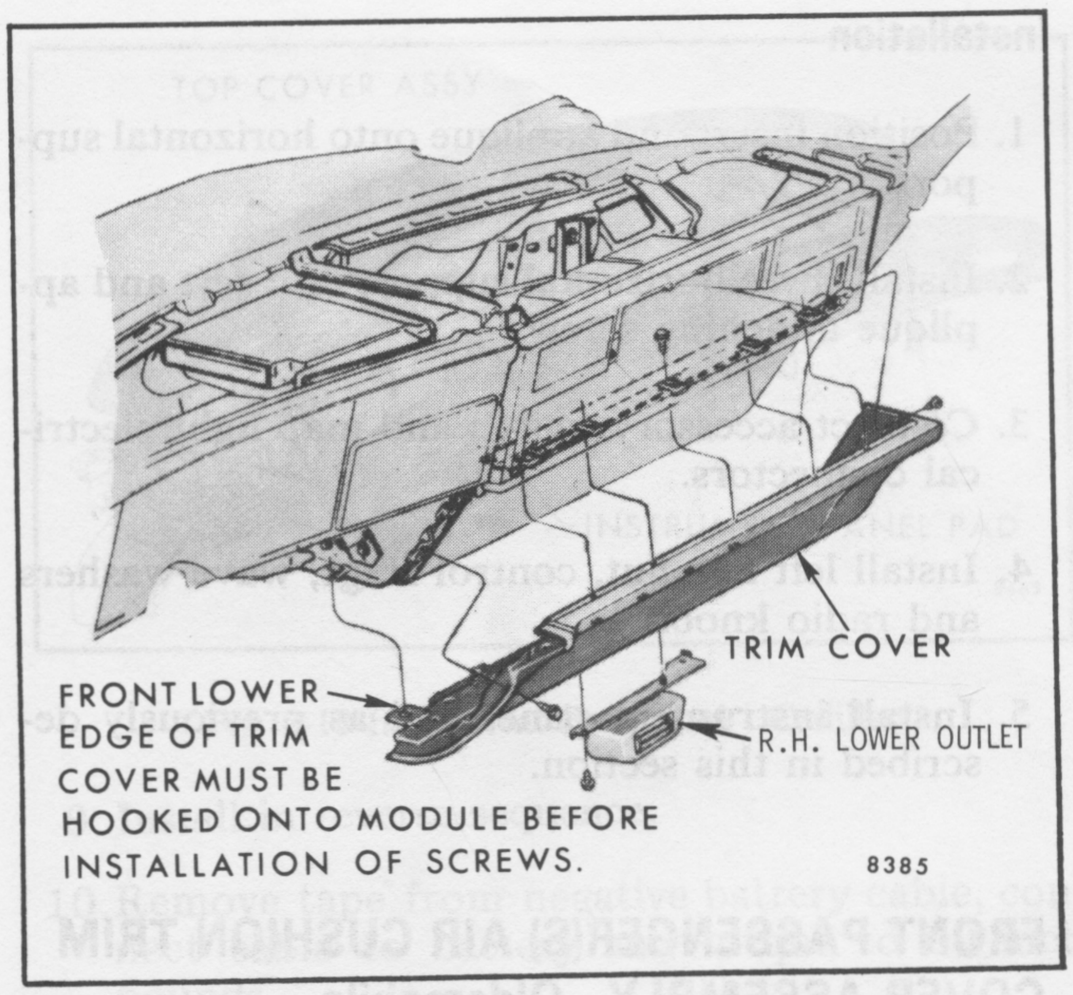

Fig. 2-15-Front Passenger(s) Air Cushion Trim Cover Assembly - Oldsmobile

2. Remove four screws from glove box door hinge to glove box and remove glove box door and ash tray door (Fig. 2-16).

3. Remove screw from lower left front edge of trim cover to extension (Fig. 2-15).

4. Remove screw from right hand side of trim cover to bracket (Fig. 2-15).

5. Remove the five screws from lower front edge of glove box attaching trim cover (Fig. 2-15).

6. Pull top edge of trim cover outward, then lower to unhook from lower edge of passenger air cushion restraint assembly.

7. Remove lower air conditioning outlet assembly from trim cover (Fig. 2-15).

NOTE: With lower right hand trim cover removed, care must be exercised so that air cushion is not torn, punctured or in any way damaged or the complete passenger air cushion will need replacing.

Installation

NOTE: Front lower edge of right hand trim cover must be hooked onto air cushion restraint assembly prior to installation of any attaching screws.

1. To install, reverse removal procedures and torque attaching bolts 20 to 30 inch pounds.

If a service lower right hand trim cover is being installed, refer to Painting Service Lower Trim Covers portion of this section.

FRONT PASSENGER(S) AIR CUSHION TRIM COVER ASSEMBLY - Buick

Removal and Installation (Refer to Fig. 2-17)

1. Remove knee restraint as previously described in this section.

2. Remove screw retaining left end of passenger side lower trim cover (1974 only).

3. Remove lower air conditioning outlet duct attaching screws.

4. Remove attaching screws from upper edge of lower trim cover.

5. Pull top of lower trim cover outward and rotate downward to release lower edge from air bag frame.

6. Reverse above procedure for installation, making sure lower lip of trim panel is first hooked over the lower edge of the passenger restraint assembly and torque attaching screws 20 to 30 inch pounds.

NOTE: Care must be taken that the air cushion is not torn, punctured or in any way damaged or the complete passenger module will require replacment.

If a service passenger side lower trim cover is being installed, refer to Painting Service Lower Trim Covers portion of this section.

FRONT PASSENGER(S) AIR CUSHION TRIM COVER ASSEMBLY - Cadillac

Removal (Refer to Figs. 2-18, 2-19 and 2-20)

1. Remove knee restraint as previously described in this section.

2. Remove air conditioning outlet grilles and instrument panel pad.

3. Remove radio knob, wave washers and left hand hex nut.

4. Reaching behind horizontal support, remove three right hand insert and applique attaching screws.

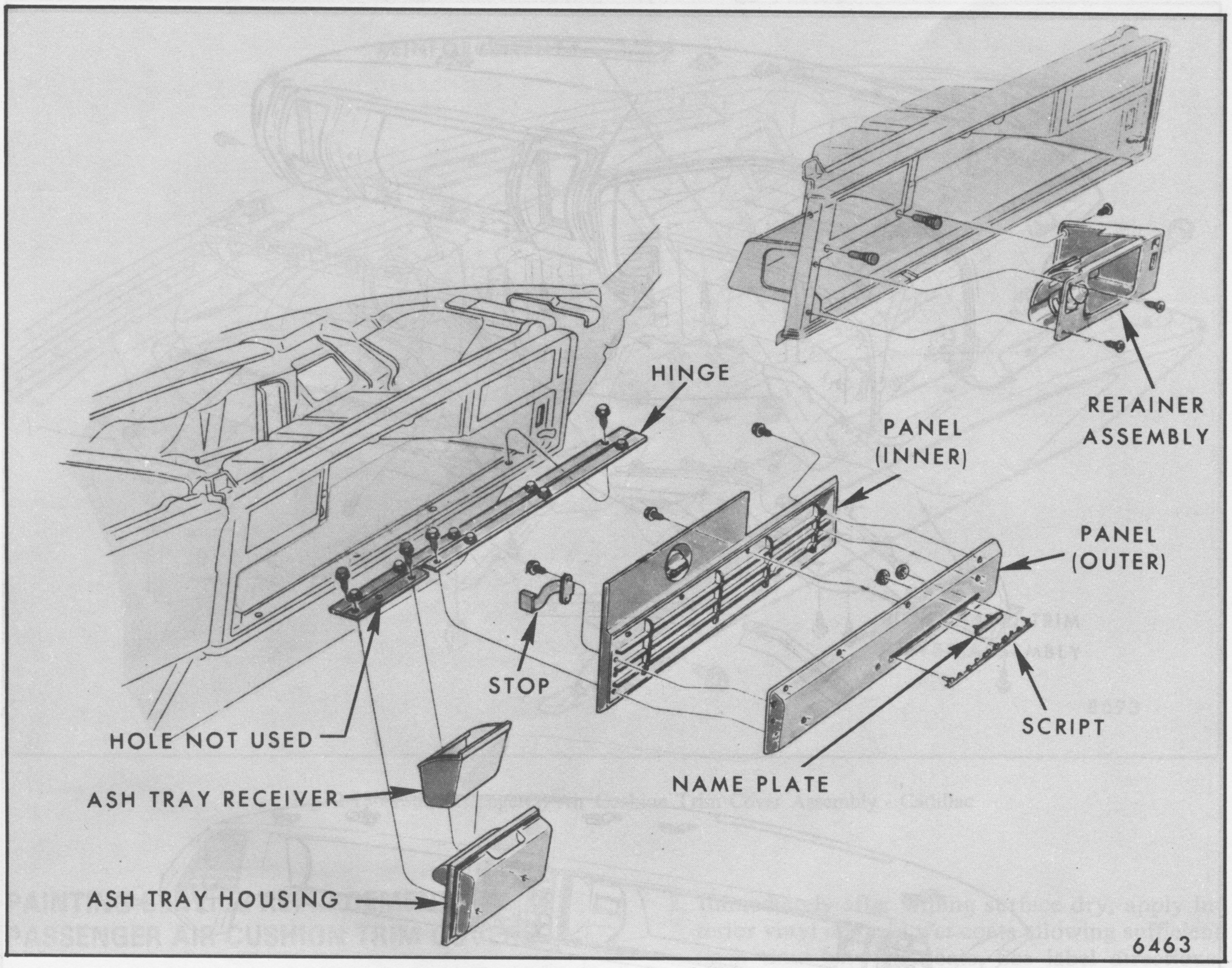

Fig. 2-16-Glove Box Door Attachment - Oldsmobile

5. Disconnect accessory switch harness.
6. Remove right hand insert and applique.
7. Remove six screws through square holes in horizontal support.
8. Remove trim screw from right side.
9. Remove trim cover to knee restraint brace screw from left side.

NOTE: With lower right hand trim cover removed, care must be exercised so that air cushion is not torn, punctured or in any way damaged or the complete passenger air cushion will need to be replaced.

Installation

NOTE: Front lower edge of right hand trim cover must be hooked onto air cushion restraint assembly prior to installation of any attaching screws. Upper edge of trim cover must be inserted between reinforcement and horizontal support.

1. To install, reverse removal procedures and torque attaching bolts 20 to 30 inch pounds.

If a service lower right hand instrument panel trim cover is being installed, refer to Painting Service Lower Trim Covers portion of this section.

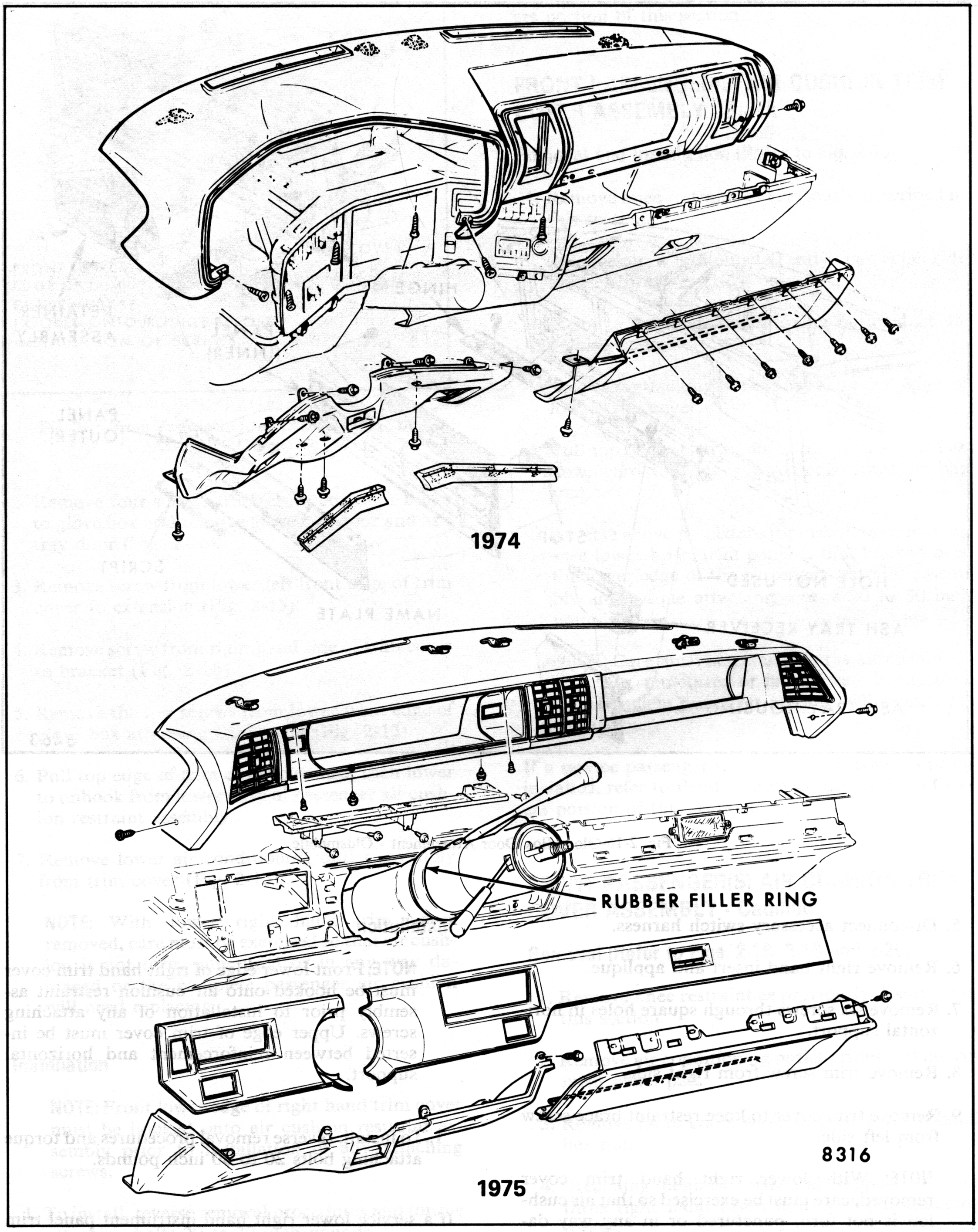

Fig. 2-17-Front Passenger(s) Air Cushion Trim Cover Assembly - Buick

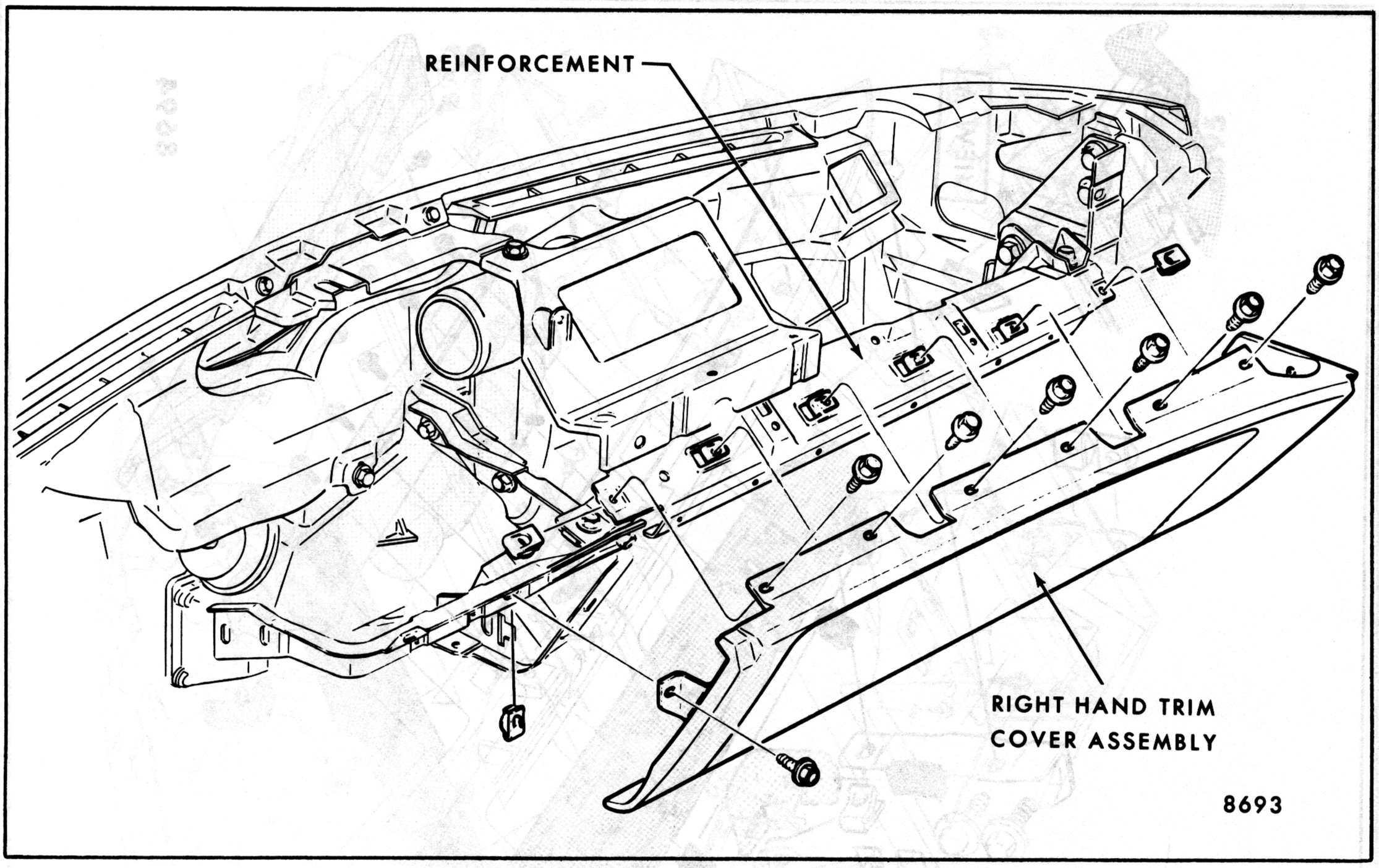

Fig. 2-18-Front Passenger(s) Air Cushion Trim Cover Assembly - Cadillac

PAINTING SERVICE REPLACEMENT FRONT PASSENGER AIR CUSHION TRIM COVERS -

All

If a service trim cover is being used, it will be necessary to paint cover to match interior vinyl color and a clear vinyl top coat to retain paint.

NOTE: No primer or primer-sealer is required.

Procedure

1. Wash part thoroughly with a vinyl cleaning and preparation solvent, such as: "Vinyl Prep", "Vinyl Prep Conditioner" or equivalent. Wipe off cleaner while still wet with clean, lint-free cloth.
2. Immediately after wiping surface dry, apply interior vinyl color in wet coats allowing sufficient flash time between coats. See label directions. Use proper vinyl color as designated by interior trim combination.
3. Before color flashes completely, apply one, wet double coat of vinyl clear top coat. Use top coat with appropriate gloss level to match adjacent similar components. When painting use "non-glare" clear vinyl. The clear coat is necessary to control the gloss requirement and to prevent "crocking" (rubbing-off) of the color coat after drying.
4. Allow to dry according to label directions before installing part.

   NOTE: Apply only sufficient color for proper hiding to avoid wash out of "grain" effect.

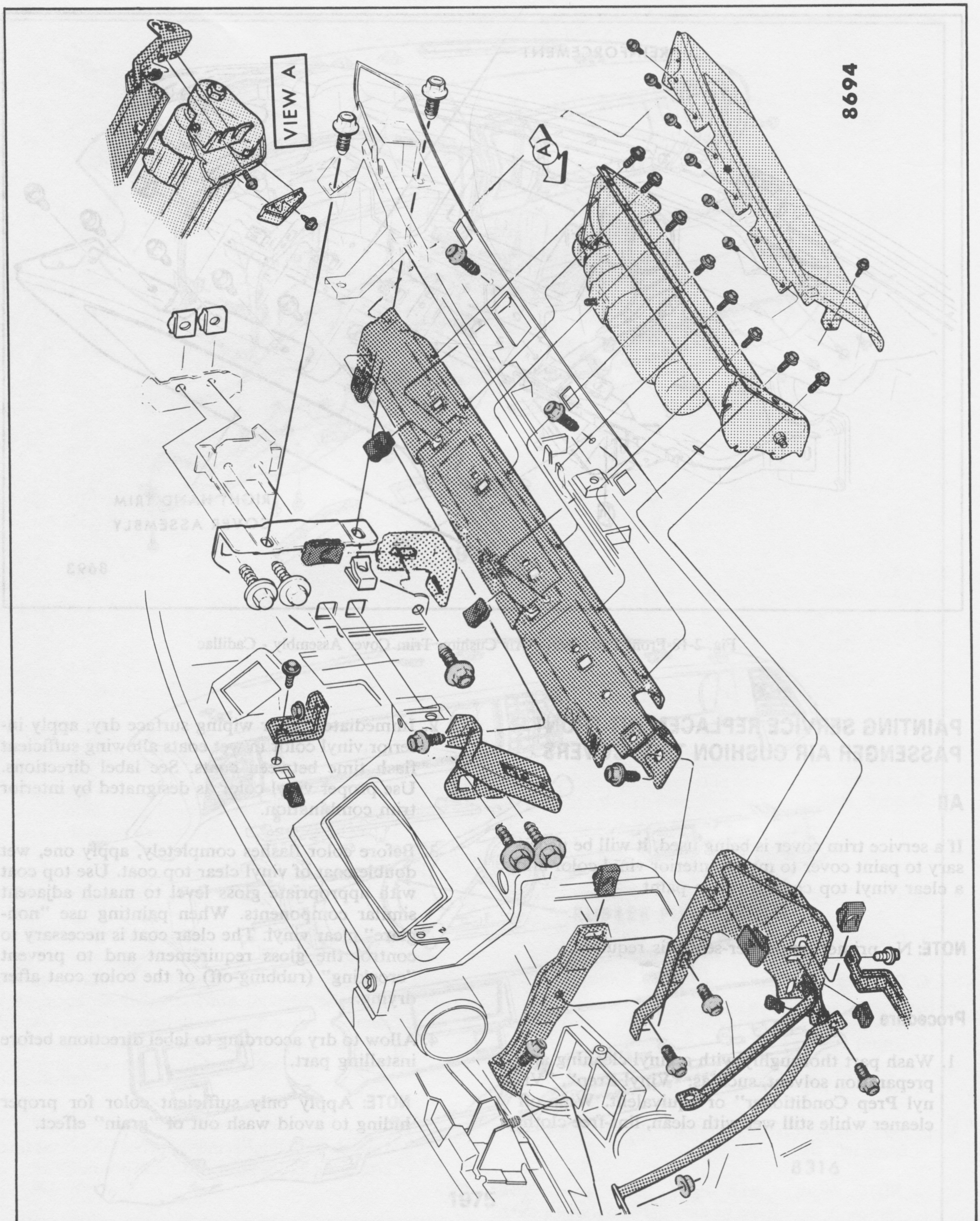

Fig. 2-19-Front Passenger(s) Air Cushion Supports - Cadillac

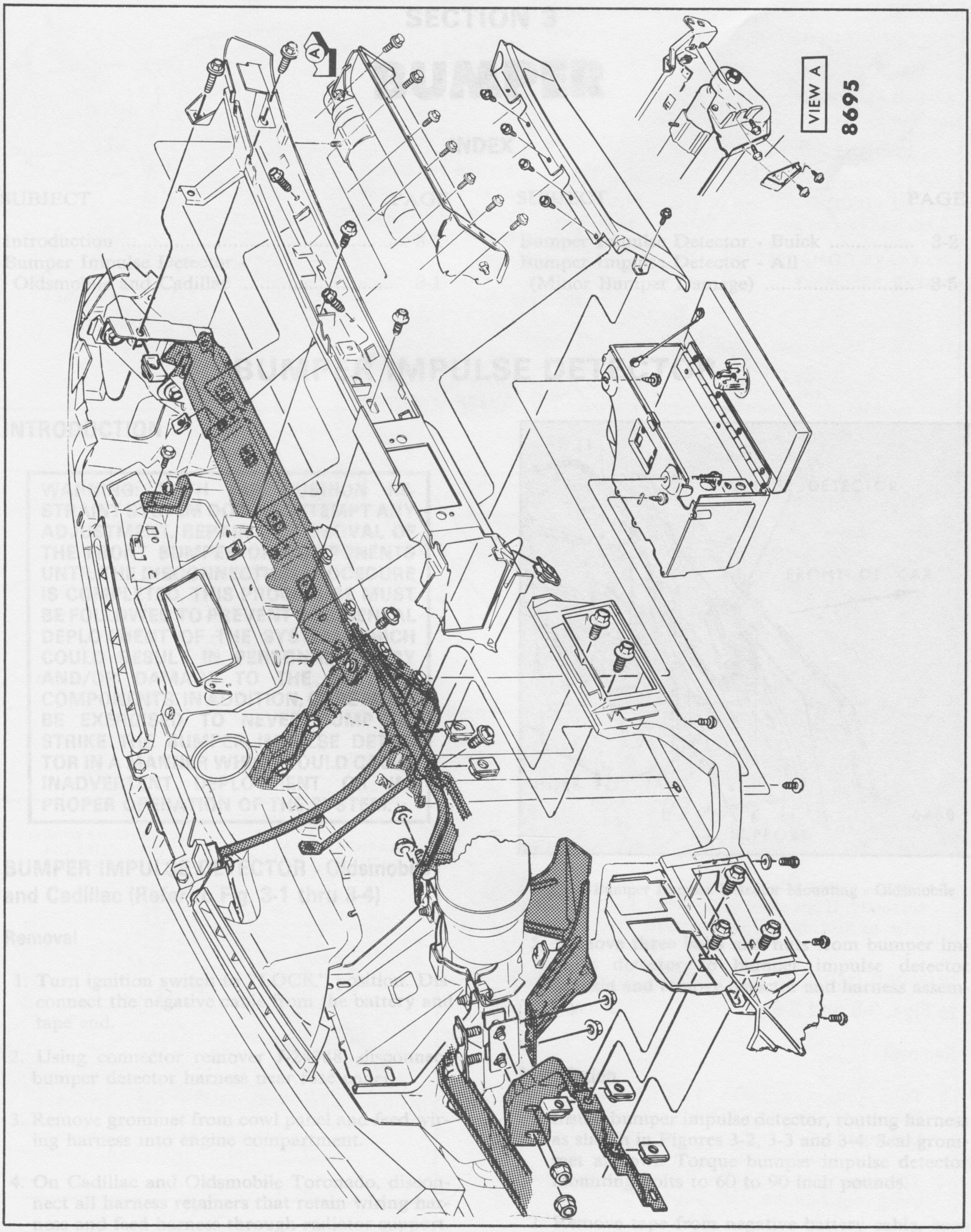

Fig. 2-20-Instrument Panel Air Cushion Restraint System Components - Cadillac

SECTION 3

BUMPER

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BUMPER IMPULSE DETECTOR

INTRODUCTION

WARNING: WITH AIR CUSHION RESTRAINT SYSTEM DO NOT ATTEMPT ANY ADJUSTMENT, REPAIR OR REMOVAL OF THE FRONT BUMPER OR COMPONENTS UNTIL THE DISCONNECTION PROCEDURE IS COMPLETED. THIS PROCEDURE MUST BE FOLLOWED TO PREVENT ACCIDENTAL DEPLOYMENT OF THE SYSTEM WHICH COULD RESULT IN PERSONAL INJURY AND/OR DAMAGE TO THE SYSTEMS COMPONENTS. IN ADDITION, CARE MUST BE EXERCISED TO NEVER BUMP OR STRIKE THE BUMPER IMPULSE DETECTOR IN A MANNER WHICH COULD CAUSE INADVERTENT DEPLOYMENT OR IMPROPER OPERATION OF THE SYSTEM.

BUMPER IMPULSE DETECTOR - Oldsmobile and Cadillac (Refer to Fig. 3-1 thru 3-4)

Removal

1. Turn ignition switch to "LOCK" position. Disconnect the negative cable from the battery and tape end.
2. Using connector remover J-24388, disconnect bumper detector harness near fuse panel.
3. Remove grommet from cowl panel and feed wiring harness into engine compartment.
4. On Cadillac and Oldsmobile Toronado, disconnect all harness retainers that retain wiring harness and feed harness through radiator support. On Oldsmobile except Toronado, feed harness over radiator support.

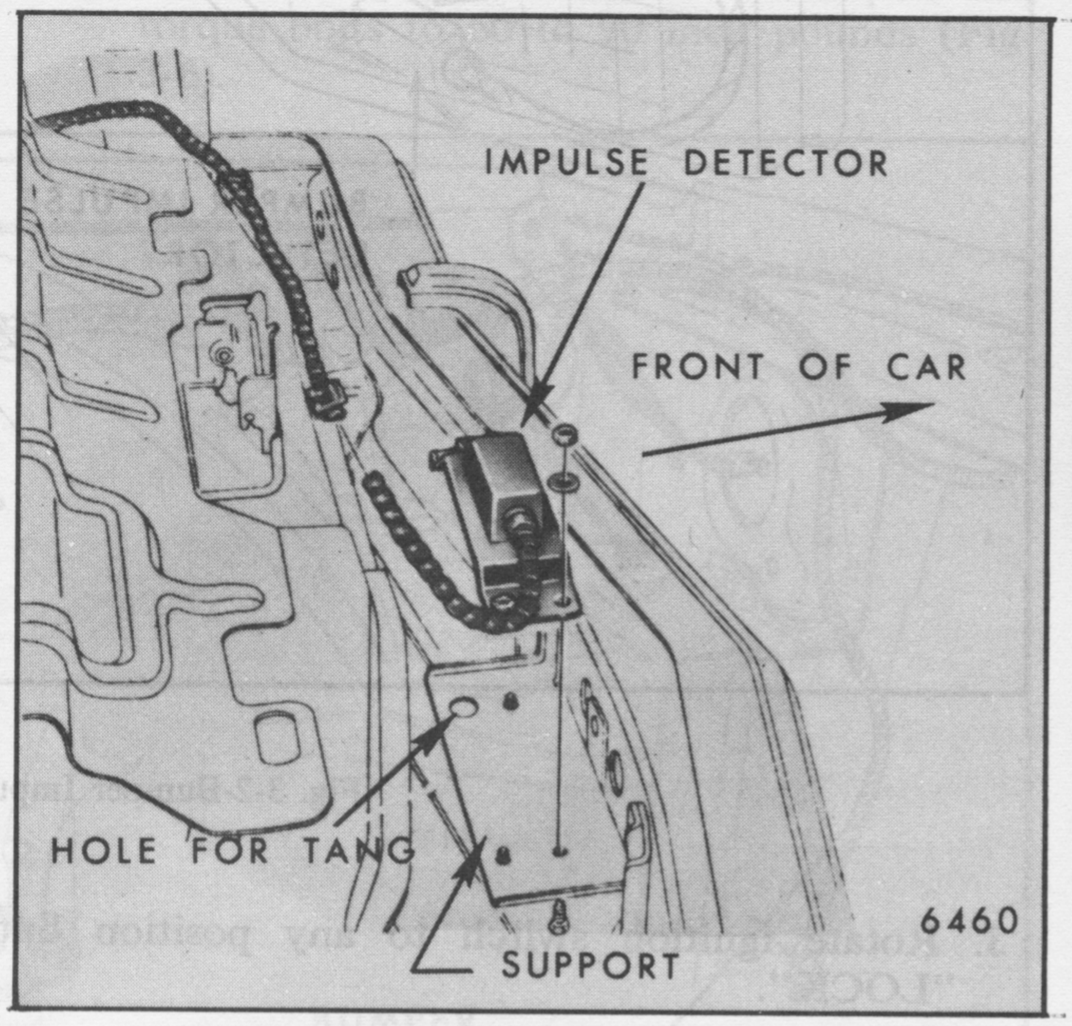


Fig. 3-1-Bumper Impulse Detector Mounting - Oldsmobile

5. Remove three bolts and nuts from bumper impulse detector to bumper impulse detector bracket and remove detector and harness assembly.

Installation

1. Install bumper impulse detector, routing harness as shown in Figures 3-2, 3-3 and 3-4. Seal grommet at cowl. Torque bumper impulse detector mounting bolts to 60 to 90 inch pounds.
2. Remove tape from negative battery cable, connect cable to battery and torque to 90 inch pounds.

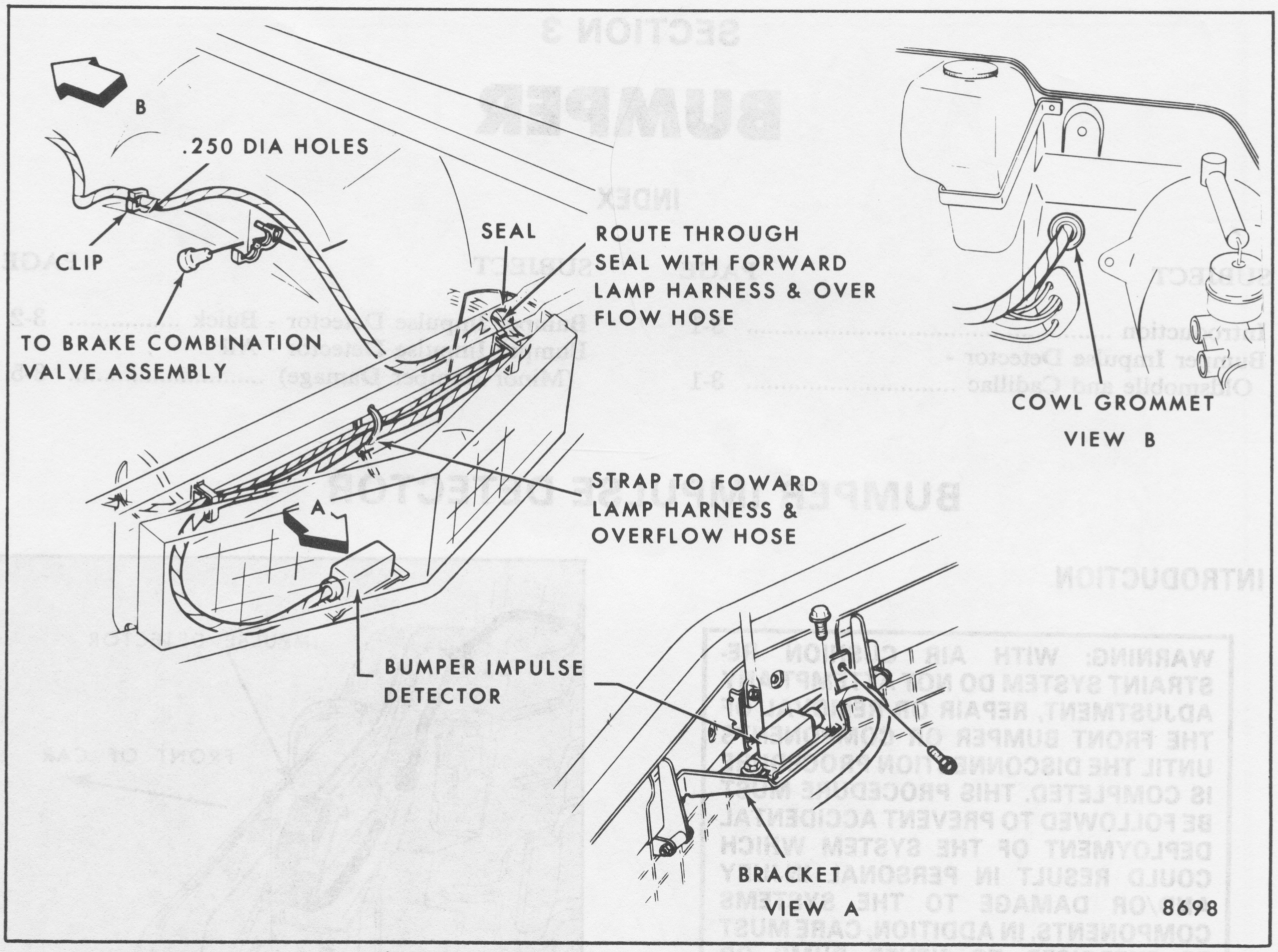


Fig. 3-2-Bumper Impulse Detector Mounting - Cadillac

3. Rotate ignition switch to any position but "LOCK".

4. Check to see that indicator lamp is operating correctly. If not okay (goes out in 3 to 9 seconds), refer to Section 1-Operation and Diagnosis.

BUMPER IMPULSE DETECTOR - Buick (Refer to Figs. 3-5 and 3-6)

Removal

1. Turn ignition switch to "LOCK" position. Disconnect the negative battery cable from battery and tape end.
2. Disconnect harness connector near fuse panel using tool J-24388.
3. Remove grommet from cowl and feed harness into engine compartment (Fig. 3-5).

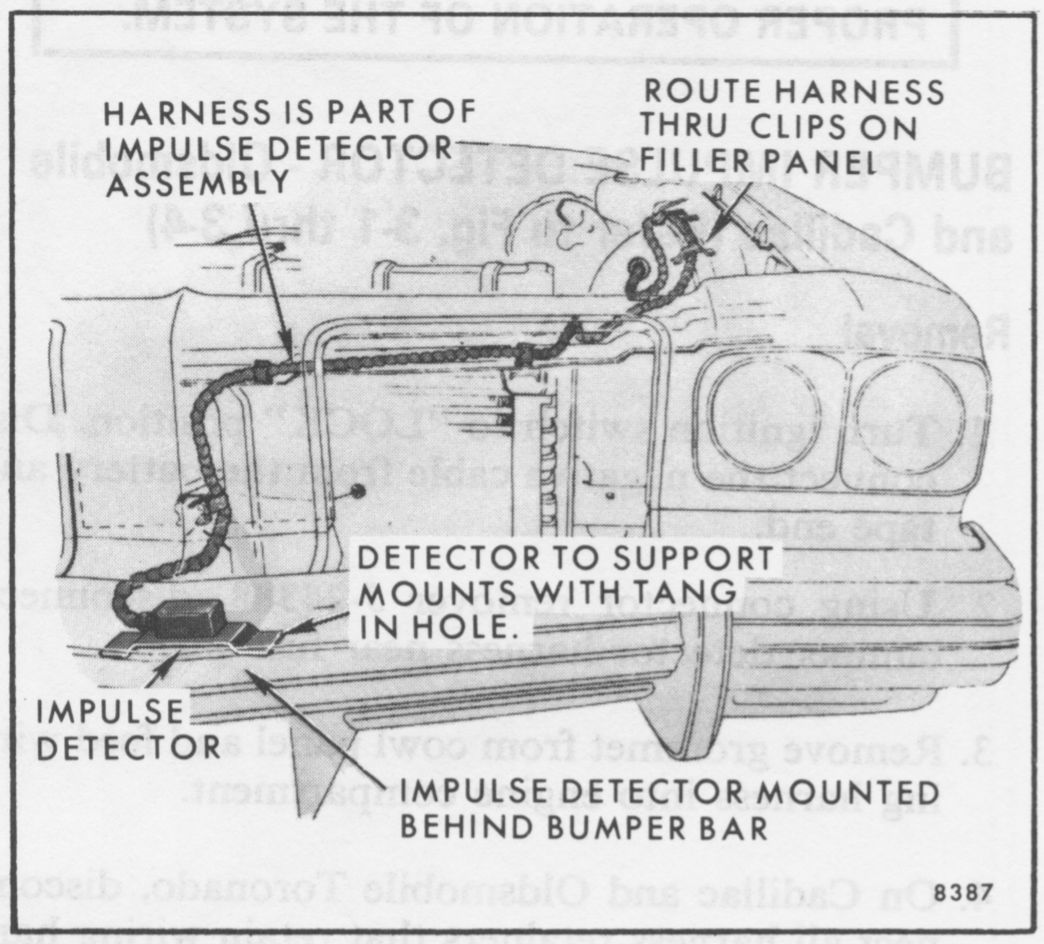

HARNESS IS PART OF IMPULSE DETECTOR ASSEMBLY
ROUTE HARNESS THRU CLIPS ON FILLER PANEL
DETECTOR TO SUPPORT MOUNTS WITH TANG IN HOLE.
IMPULSE DETECTOR
IMPULSE DETECTOR MOUNTED BEHIND BUMPER BAR
8387

Fig. 3-3-Bumper Impulse Detector Harness - All Oldsmobiles Except Toronado

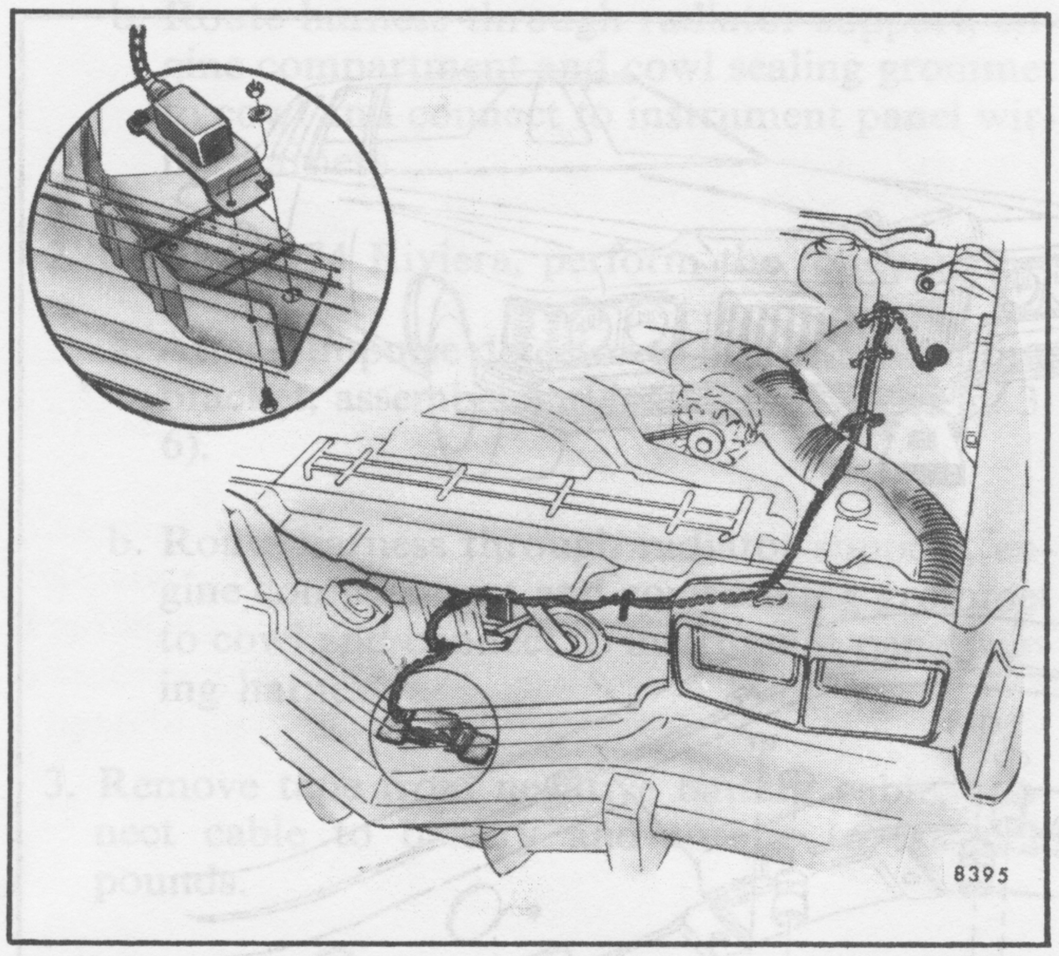


Fig. 3-4-Bumper Impulse Detector Harness - Oldsmobile Toronado

4. Disconnect harness from engine compartment retainer and feed harness through radiator support.

5. On 1974 and 1975 cars except the 1974 Riviera, remove impulse detector attaching screws and detector assembly from bumper.

6. On 1974 Riviera, remove front bumper. Disassemble sufficiently to gain access to the impulse detector and remove attaching screws and detector assembly from bumper.

Installation

1. On 1974 and 1975 cars, except the 1974 Riviera, perform the the following:

   a. Attach impulse detector to bumper and torque bolts to 60 to 90 inch pounds (Fig. 3-6).

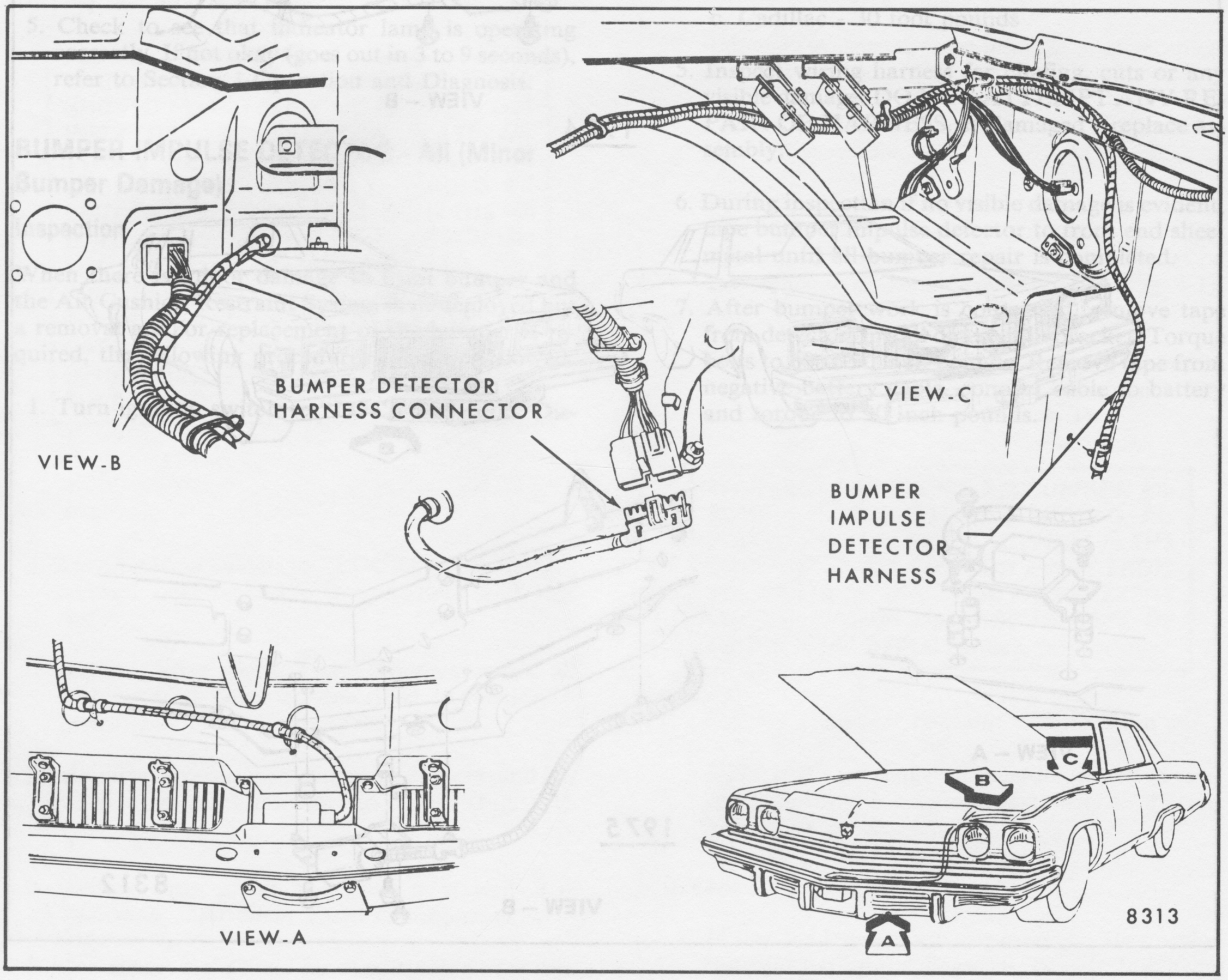


Fig. 3-5-Bumper Impulse Detector Installation - Buick

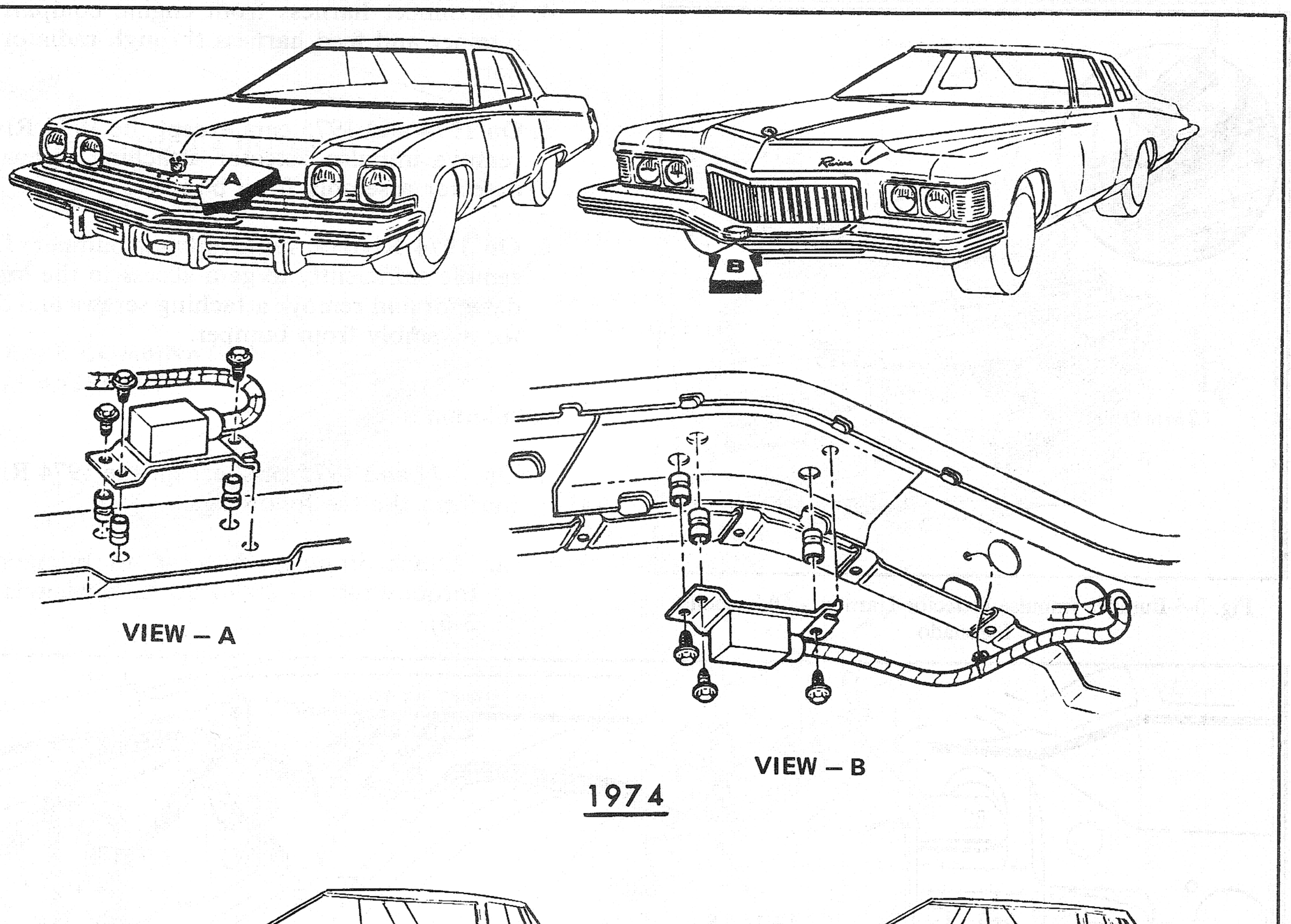


Fig. 3-6-Bumper Impulse Detector Location - Buick Styles

b. Route harness through radiator support, engine compartment and cowl sealing grommet to cowl and connect to instrument panel wiring harness.

2. On the 1974 Riviera, perform the following:

a. Attach impulse detector to bumper mounting bracket, assemble and install bumper (Fig. 3-6).

b. Route harness through radiator support, engine compartment and cowl sealing grommet to cowl and connect to instrument panel wiring harness.

3. Remove tape from negative battery cable, connect cable to battery and torque to 90 inch pounds.

4. Rotate ignition switch to any position but "LOCK".

5. Check to see that indicator lamp is operating correctly. If not okay (goes out in 3 to 9 seconds), refer to Section 1-Operation and Diagnosis.

BUMPER IMPULSE DETECTOR - All (Minor Bumper Damage)

Inspection

When there is minor damage to front bumper and the Air Cushion Restraint System is undeployed but a removal and/or replacement of the bumper is required, the following procedures must be followed.

1. Turn ignition switch to "LOCK" position. Disconnect the negative battery cable from battery and tape end.

2. Remove three bolts and nuts from bumper impulse detector to bumper impulse detector bracket and lift detector from bracket.

3. Inspect impulse detector for any visual damage to case or mounting. If damaged - replace assembly (dents, looseness of mounting etc.).

4. On Oldsmobile and Cadillac styles, inspect mounting bracket for rigid attachment to bumper reinforcement and damage to bracket. If damaged, replace bracket. If attachment not rigid, replace or retorque attachment making certain bolts are torqued as follows:

a. Oldsmobile except Toronado - 25 foot pounds

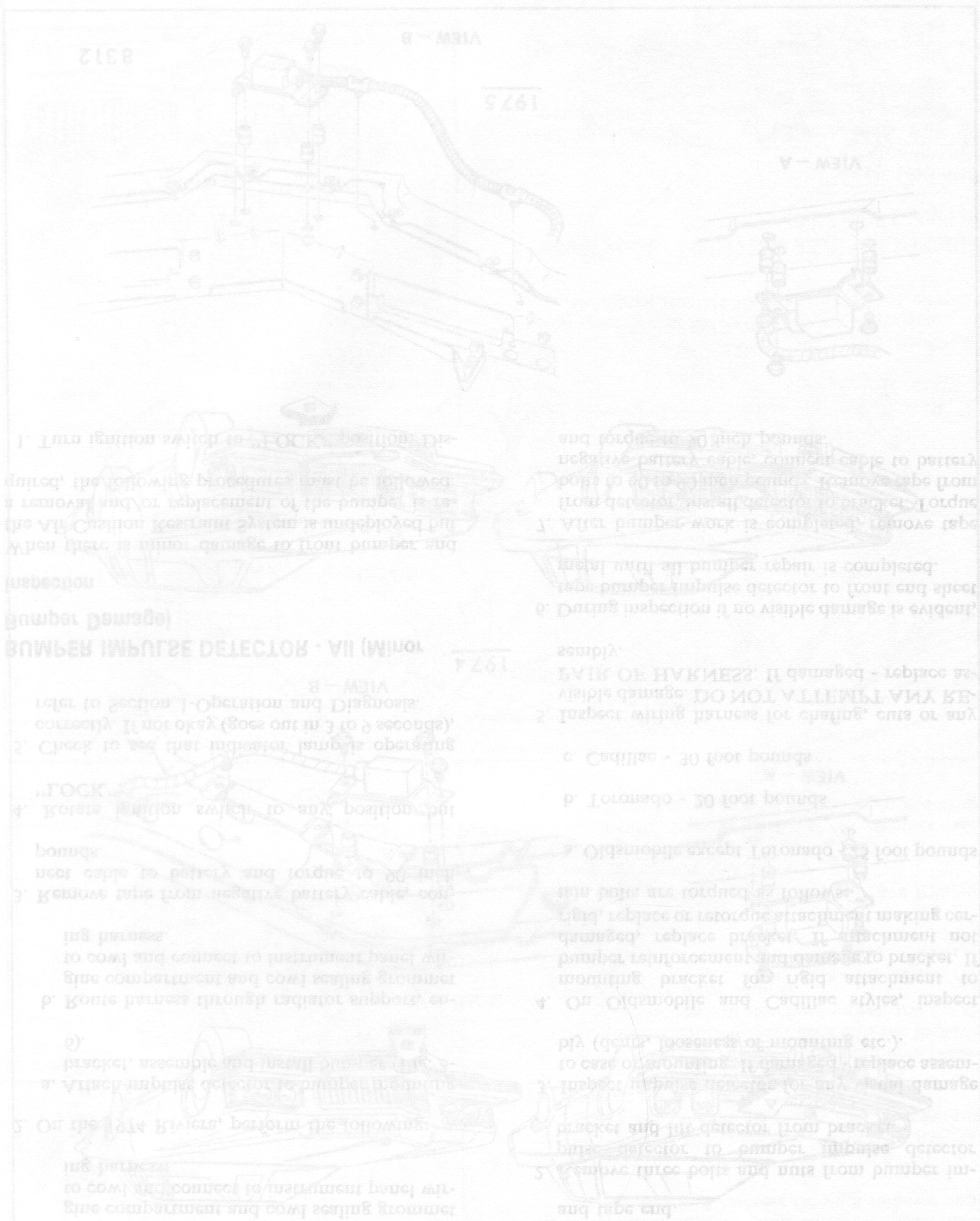
b. Toronado - 20 foot pounds

c. Cadillac - 30 foot pounds

5. Inspect wiring harness for chafing, cuts or any visible damage. DO NOT ATTEMPT ANY REPAIR OF HARNESS. If damaged - replace assembly.

6. During inspection if no visible damage is evident, tape bumper impulse detector to front end sheet metal until all bumper repair is completed.

7. After bumper work is completed, remove tape from detector, install detector to bracket. Torque bolts to 60 to 90 inch pounds. Remove tape from negative battery cable, connect cable to battery and torque to 90 inch pounds.



SECTION 4

PASSENGER(S) MODULE

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PASSENGER(S) MODULE - Oldsmobile (Refer to Figs. 4-1 and 4-2)

WARNING: THE PASSENGER(S) MODULE SHOULD ALWAYS BE CARRIED WITH THE INFLATOR AND REACTION PLATE BETWEEN THE PERSON'S BODY AND THE CUSHION. THE ASSEMBLY SHOULD BE LAID ON A FLAT SURFACE WITH THE INFLATOR AND REACTION PLATE BETWEEN THE FLAT SURFACE AND THE CUSHION. THIS IS NECESSARY TO ALLOW FREE SPACE FOR CUSHION EXPANSION IN CASE OF ACCIDENTAL DEPLOYMENT. OTHERWISE, SERIOUS INJURY MAY RESULT.

Removal

1. Turn ignition switch to "LOCK" position. Disconnect negative cable from battery and tape end.

2. Remove knee restraint and front passenger air cushion trim cover as described in Section 2- Instrument Panel Components.

3. Remove six screws attaching support and air cushion restraint assembly to tie bar (Fig. 4-1).

4. Remove instrument panel pad as described in Section 2- Instrument Panel Components.

5. Disconnect right hand air conditioning hose (upper) at manifold (Fig. 4-2).

6. Using tool J-24388, disconnect passenger module wiring harness.

7. Remove two screws from left side of air cushion restraint assembly (Fig. 4-1).

8. Remove two screws from right side of air cushion restraint assembly.

   NOTE: Some cars will have two washers on each bolt between the air cushion restraint assembly and the right hand end support. These must be reinstalled to obtain proper alignment (Fig. 4-1).

9. While supporting air cushion restraint assembly remove bolt from behind instrument panel that attaches support to cowl (Fig. 4- 1).

WARNING: PASSENGER AIR CUSHION ASSEMBLY (NON-DEPLOYED) SHOULD ALWAYS BE CARRIED WITH THE UNCOVERED AIR CUSHION AWAY FROM ALL PARTS OF ONES BODY TO PREVENT INJURY AND/OR DAMAGE IN CASE OF ACCIDENTAL DEPLOYMENT.

10. Remove passenger restraint cushion from car.

    NOTE: If the passenger air cushion restraint is to be replaced with a service part, refer to Section 6-Parts Disposal.

Installation

1. If test load was used in passenger air cushion restraint wiring for diagnosis, remove load from connector.

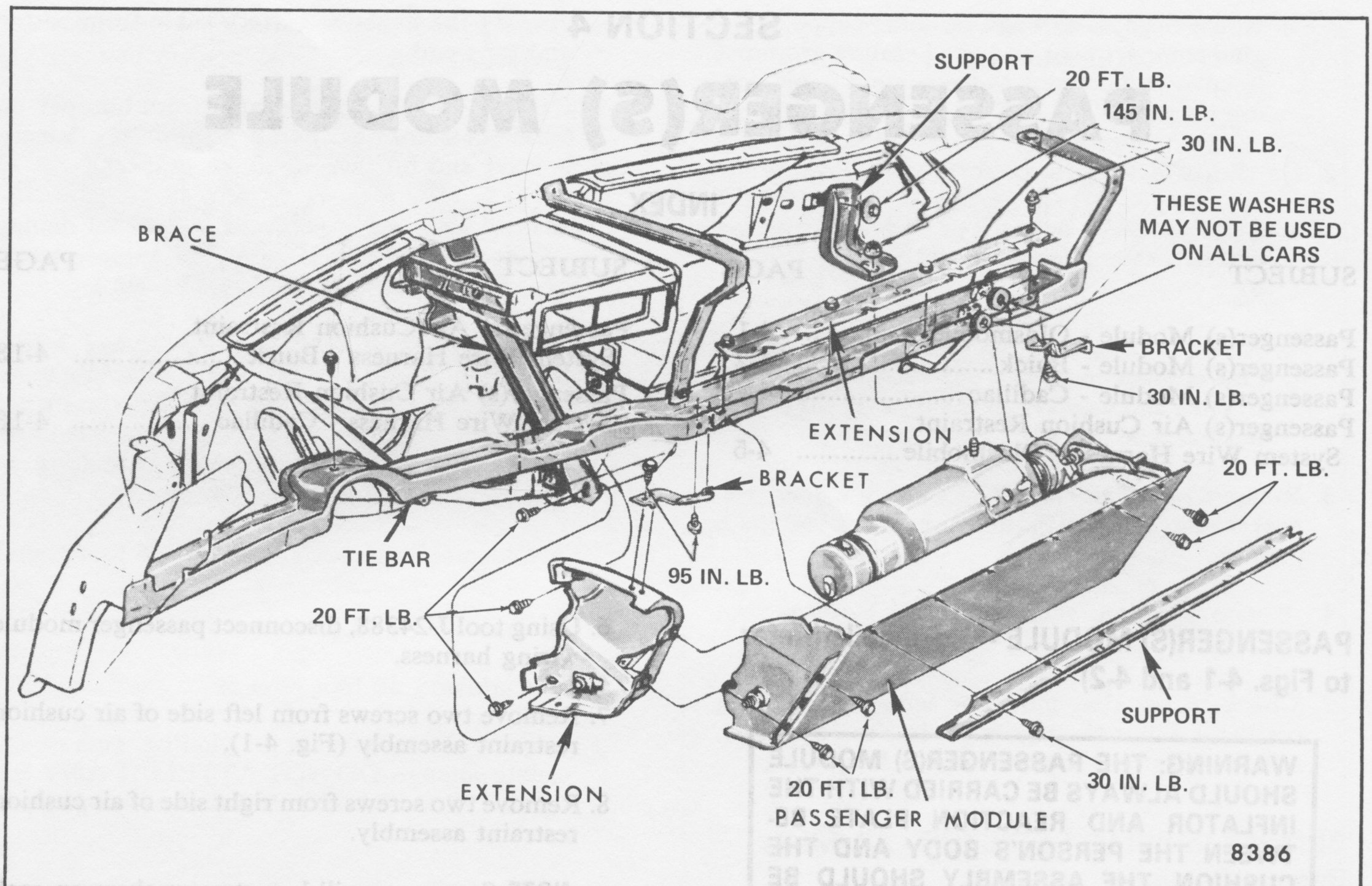


Fig. 4-1-Passenger(s) Air Cushion Attachment - Oldsmobile

2. Carefully position passenger air cushion restraint assembly into car and loosely attach bolt through support into cowl. Connect wiring harness to module assembly.

3. Remove tape from negative battery cable, connect cable to battery and torque to 90 inch pounds.

4. Rotate ignition switch to any position but "LOCK".

5. Recheck to see that indicator lamp is now operating correctly. If okay, proceed to Step 6, if not perform a diagnosis test.

6. Turn ignition switch to "LOCK" position. Disconnect negative cable from battery and tape end.

7. Remove analyzer J-24628 from air cushion restraint system. Reconnect air cushion restraint system connectors to system.

8. Reverse removal procedures.

PASSENGER(S) MODULE - Buick (Refer to Fig. 4-3)

WARNING: THE PASSENGER(S) MODULE SHOULD ALWAYS BE CARRIED WITH THE INFLATOR AND REACTION PLATE BETWEEN THE PERSON'S BODY AND THE CUSHION. THE ASSEMBLY SHOULD BE LAID ON A FLAT SURFACE WITH THE INFLATOR AND REACTION PLATE BETWEEN THE FLAT SURFACE AND THE CUSHION. THIS IS NECESSARY TO ALLOW FREE SPACE FOR CUSHION EXPANSION IN CASE OF ACCIDENTAL DEPLOYMENT. OTHERWISE, SERIOUS INJURY MAY RESULT.

Removal

1. Turn ignition switch to "LOCK" position. Disconnect negative cable from battery and tape end.

2. Remove knee restraint and front passenger air cushion trim cover as described in Section 2-Instrument Panel Components.

3. Remove door and glove box.

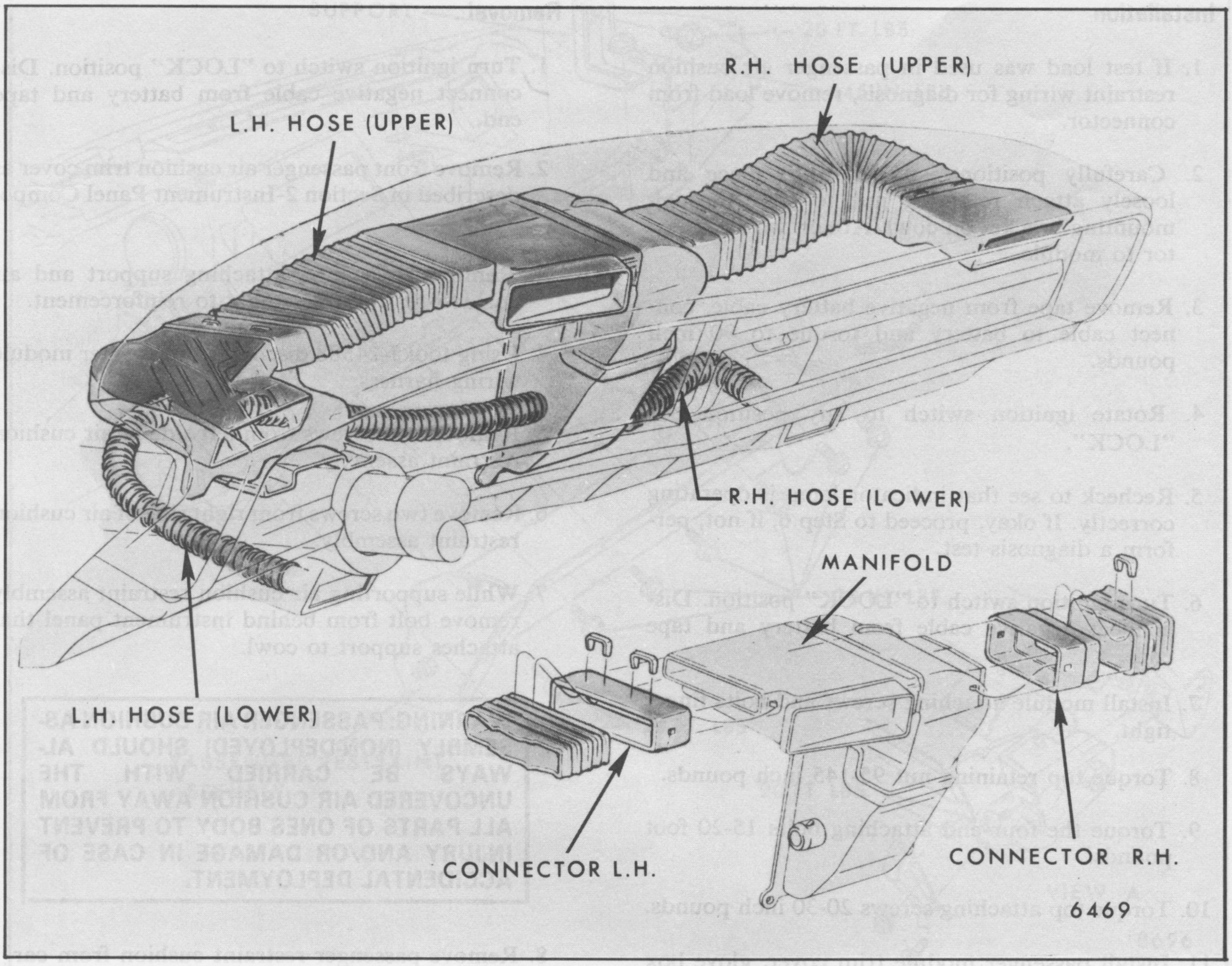


Fig. 4-2-Air Conditioning Hose Routing - Oldsmobile

4. Disconnect passenger module harness connector from module using tool J-24388, and loosen module to top bracket retaining nut.
5. Remove the screws across the top and the two bolts at each end attaching the module assembly to the instrument panel frame (Fig. 4- 3).
6. Support module, remove top attaching nut and remove the module assembly.

WARNING: PASSENGER AIR CUSHION ASSEMBLY (NON-DEPLOYED) SHOULD ALWAYS BE CARRIED WITH THE UNCOVERED AIR CUSHION AWAY FROM ALL PARTS OF ONES BODY TO PREVENT INJURY AND/OR DAMAGE IN CASE OF ACCIDENTAL DEPLOYMENT.

NOTE: If the passenger air cushion restraint is to be replaced with a service part, refer to Section 6-Parts Disposal.

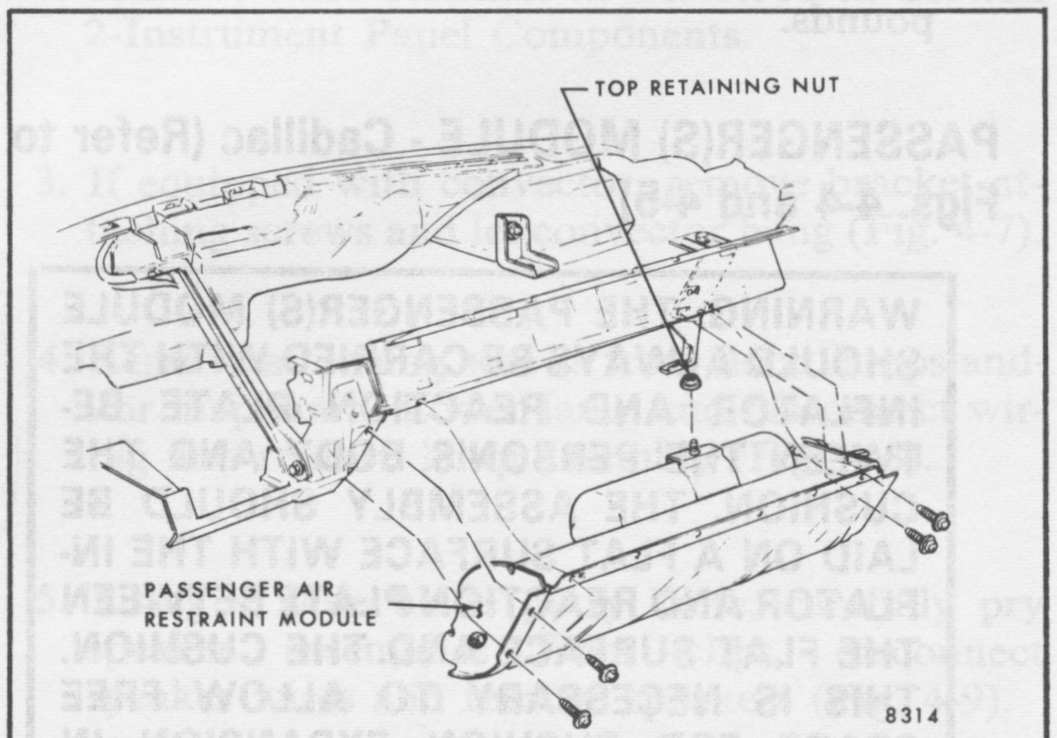


Fig. 4-3-Passenger(s) Air Cushion Assembly Installation - Buick

Installation

1. If test load was used in passenger air cushion restraint wiring for diagnosis, remove load from connector.

2. Carefully position assembly into place and loosely attach retaining nut to stud through mounting bracket on cowl. Attach wire connector to module.

3. Remove tape from negative battery cable, connect cable to battery and torque to 90 inch pounds.

4. Rotate ignition switch to any position but "LOCK".

5. Recheck to see that indicator lamp is operating correctly. If okay, proceed to Step 6, if not, perform a diagnosis test.

6. Turn ignition switch to "LOCK" position. Disconnect negative cable from battery and tape end.

7. Install module attaching screws and bolts finger tight.

8. Torque top retaining nut 95-145 inch pounds.

9. Torque the four end attaching bolts 15-20 foot pounds.

10. Torque top attaching screws 20-30 inch pounds.

11. Install passenger module trim cover, glove box and door, knee restraint and trim plates.

12. Remove tape from negative battery cable, connect cable to battery and torque to 90 inch pounds.

PASSENGER(S) MODULE - Cadillac (Refer to Figs. 4-4 and 4-5)

WARNING: THE PASSENGER(S) MODULE SHOULD ALWAYS BE CARRIED WITH THE INFLATOR AND REACTION PLATE BETWEEN THE PERSON'S BODY AND THE CUSHION. THE ASSEMBLY SHOULD BE LAID ON A FLAT SURFACE WITH THE INFLATOR AND REACTION PLATE BETWEEN THE FLAT SURFACE AND THE CUSHION. THIS IS NECESSARY TO ALLOW FREE SPACE FOR CUSHION EXPANSION IN CASE OF ACCIDENTAL DEPLOYMENT. OTHERWISE, SERIOUS INJURY MAY RESULT.

Removal

1. Turn ignition switch to "LOCK" position. Disconnect negative cable from battery and tape end.

2. Remove front passenger air cushion trim cover as described in Section 2-Instrument Panel Components.

3. Remove six screws attaching support and air cushion restraint assembly to reinforcement.

4. Using tool J-24388 disconnect passenger module wiring harness.

5. Remove two screws from left side of air cushion restraint assembly.

6. Remove two screws from right side of air cushion restraint assembly.

7. While supporting air cushion restraint assembly remove bolt from behind instrument panel that attaches support to cowl.

WARNING: PASSENGER AIR CUSHION ASSEMBLY (NON-DEPLOYED) SHOULD ALWAYS BE CARRIED WITH THE UNCOVERED AIR CUSHION AWAY FROM ALL PARTS OF ONES BODY TO PREVENT INJURY AND/OR DAMAGE IN CASE OF ACCIDENTAL DEPLOYMENT.

8. Remove passenger restraint cushion from car.

NOTE: If the passenger air cushion restraint is to be replaced with a service part, refer to Section 6-Parts Disposal.

Installation

1. If test load was used in passenger air cushion restraint wiring for diagnosis, remove load from connector.

2. Carefully position passenger air cushion restraint assembly into car and loosely attach bolt through support into cowl. Connect wiring harness to module assembly.

3. Remove tape from negative battery cable, connect cable to battery and torque to 90 inch pounds.

4. Rotate ignition switch to any position but "LOCK".

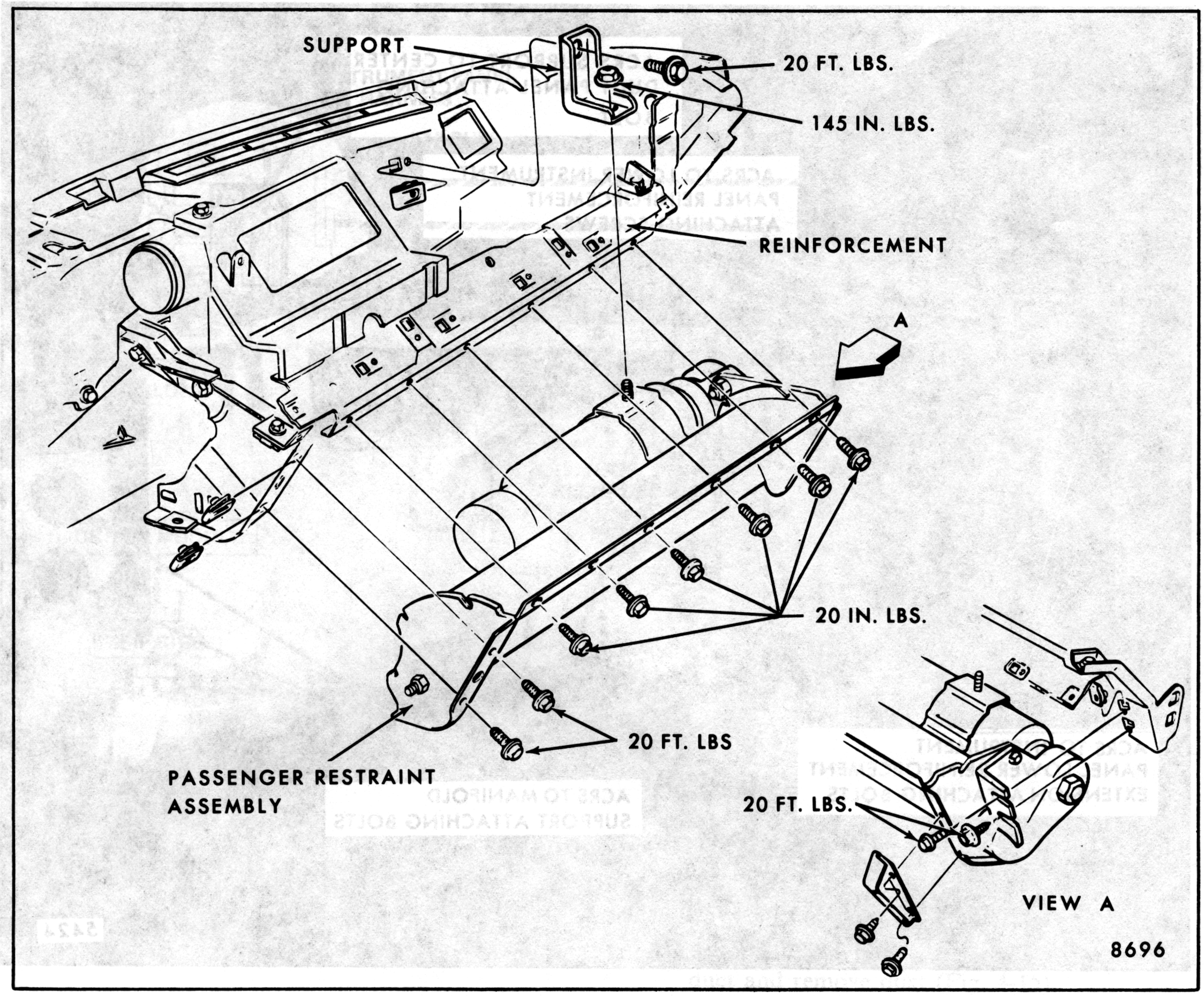


Fig. 4-4-Front Passenger Restraint Assembly Cover - Cadillac

5. Recheck to see if indicator lamp is operating correctly. If okay, proceed to Step 6, if not, perform a diagnosis test.

6. Turn ignition switch to "LOCK" position. Disconnect negative cable from battery and tape end.

7. Reverse removal procedures to complete installation.

PASSENGER(S) AIR CUSHION RESTRAINT SYSTEM WIRE HARNESS - Oldsmobile

Removal (Refer to Figs. 4-6 thru 4-15)

1. Turn ignition switch to "LOCK" position. Disconnect negative cable from battery and tape end.

2. Remove knee restraint as described in Section 2-Instrument Panel Components.

3. If equipped with convector, remove bracket attaching screws and let convector hang (Fig. 4-7).

4. Remove attaching screws from flood lamps and/or map lamp. Lower lamp and disconnect wiring and remove lamp assembly (Fig. 4-8).

5. Using a wide blade putty knife, carefully pry speaker assemblies from clips, disconnect speaker wires and remove speakers (Fig. 4-9).

6. Remove one screw from each speaker cavity in instrument panel pad (Fig. 4-10).

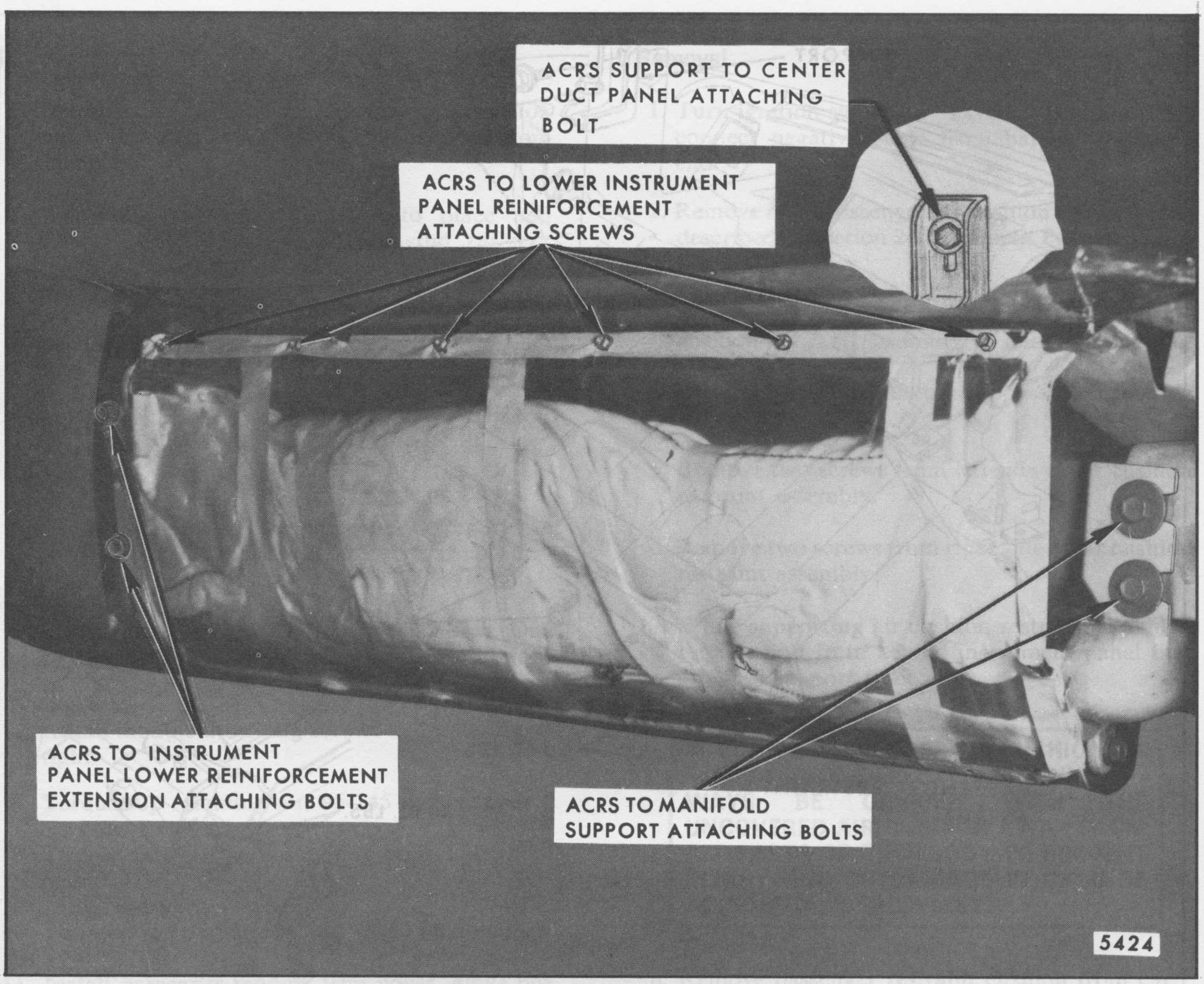

ACRS SUPPORT TO CENTER DUCT PANEL ATTACHING BOLT
ACRS TO LOWER INSTRUMENT PANEL REINIFORCEMENT ATTACHING SCREWS
ACRS TO INSTRUMENT PANEL LOWER REINIFORCEMENT EXTENSION ATTACHING BOLTS
ACRS TO MANIFOLD SUPPORT ATTACHING BOLTS
5424

Fig. 4-5-Front Passenger(s) Air Cushion Restraint Assembly - Cadillac

7. Remove one screw from left lower outside edge of instrument panel pad and two screws from instrument cluster (above speedometer) (Fig. 4-10).

8. Open glove box door and remove one screw from lower right corner of glove box and two screws from top edge of glove box (Fig. 4-10).

9. Grasp front center edge of instrument panel pad and pull to release clips at windshield edge of pad and remove pad to a clean padded bench.

10. Remove left hand and right hand hose (upper) from outlet ducts and manifold (Fig. 4-11).

11. Remove two screws from ash tray housing to hinge (Fig. 4-12).

12. Remove screws from glove box door stop (Fig. 4-12).

13. Remove three screws from ash tray retainer to glove box (Fig. 4- 12).

14. Remove screw from upper corners of right hand upper trim panel (Fig. 4-13).

15. Remove three screws from instrument panel center support.

16. Remove screw attaching manifold and remove manifold (Fig. 4-14).

17. Remove screw attaching defroster duct to heater case (Fig. 4- 14).

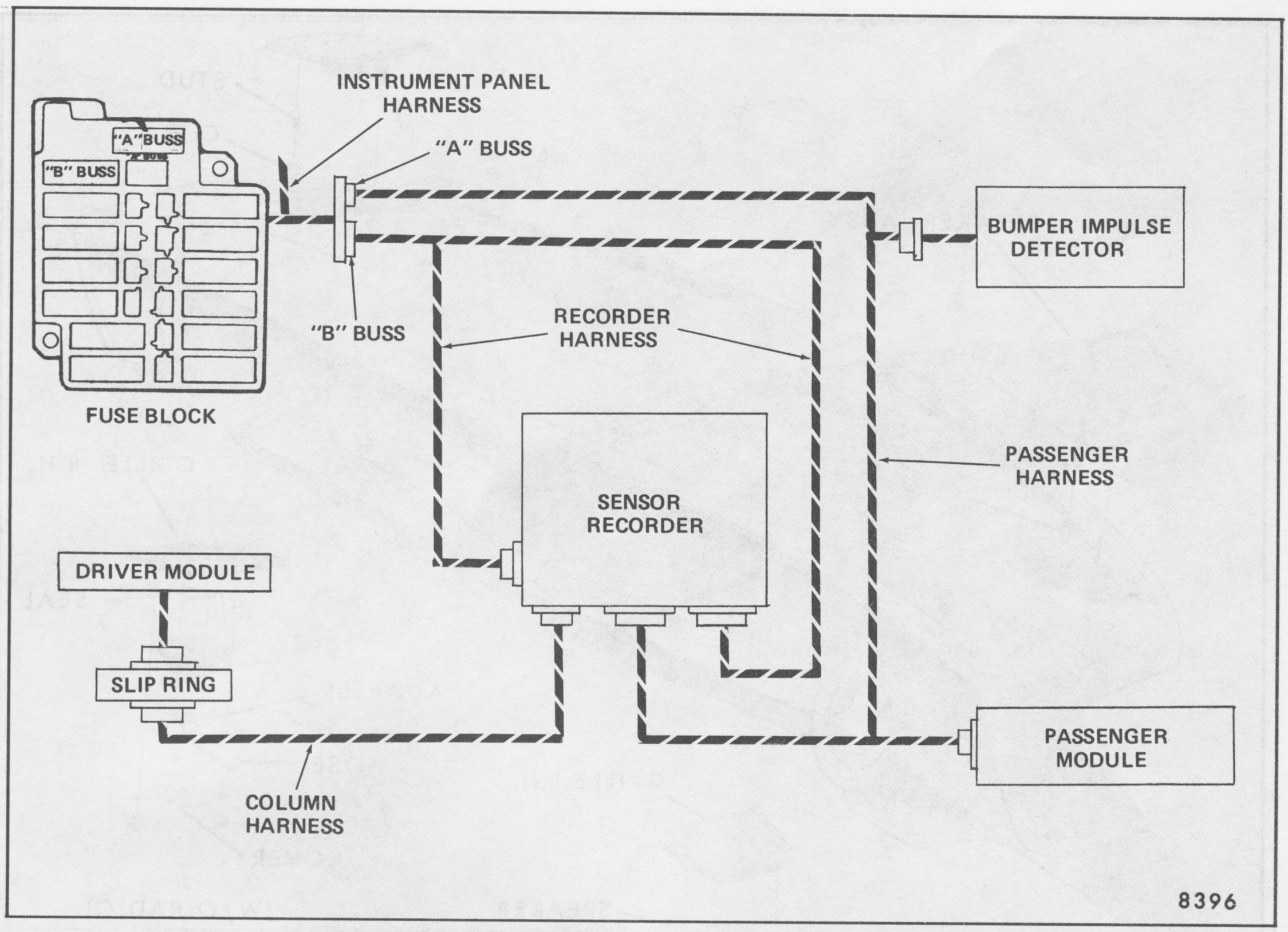


Fig. 4-6-Air Cushion Restraint System Harness Connectors - Oldsmobile

18. Straighten attaching tabs at top ends of defroster duct and remove duct (Fig. 4-15).

19. Using tool J-24388, disconnect passenger harness connectors (Fig. 4-6):

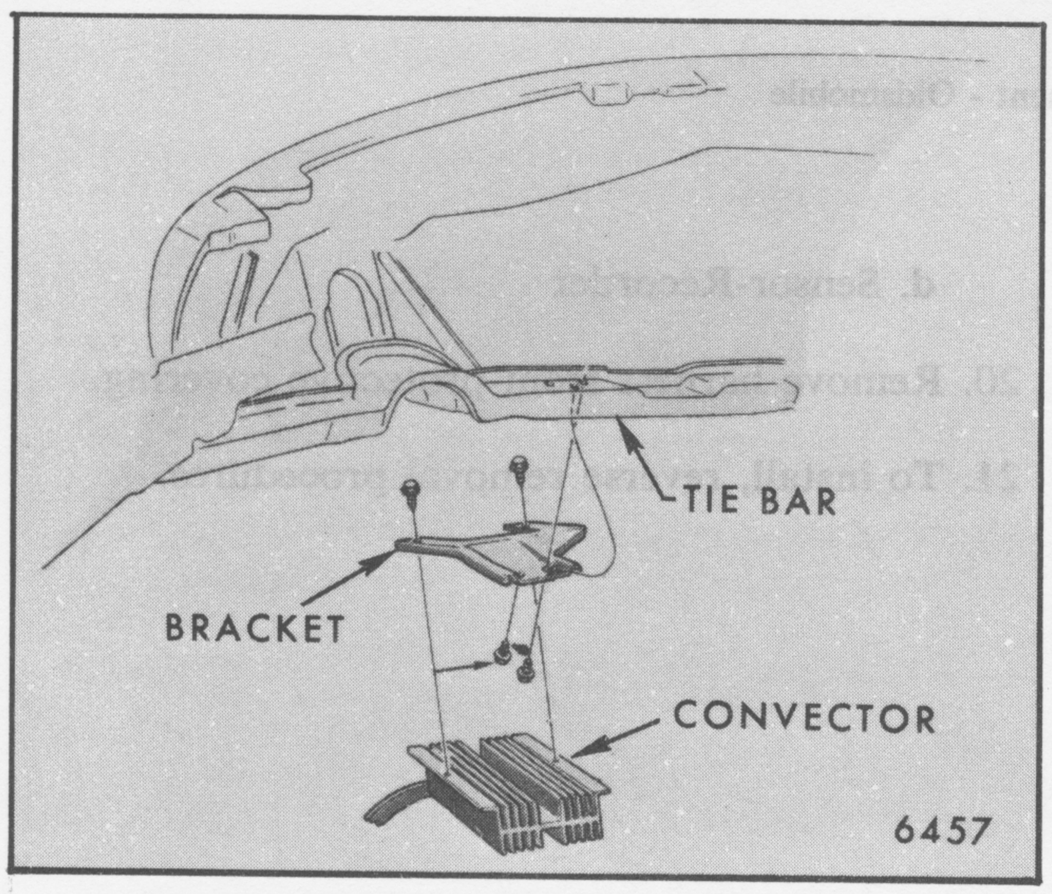


Fig. 4-7-Connector Attachment - Oldsmobile

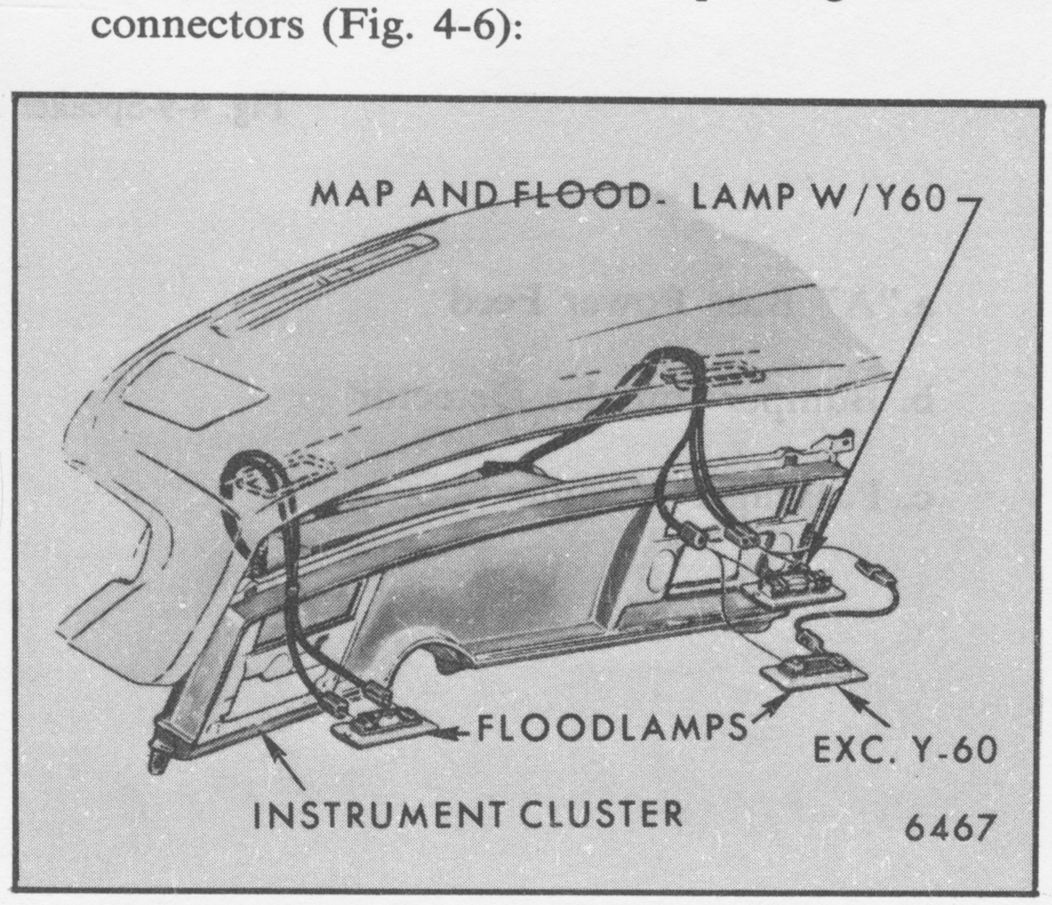


Fig. 4-8-Map and Flood Lamp Attachment - Oldsmobile

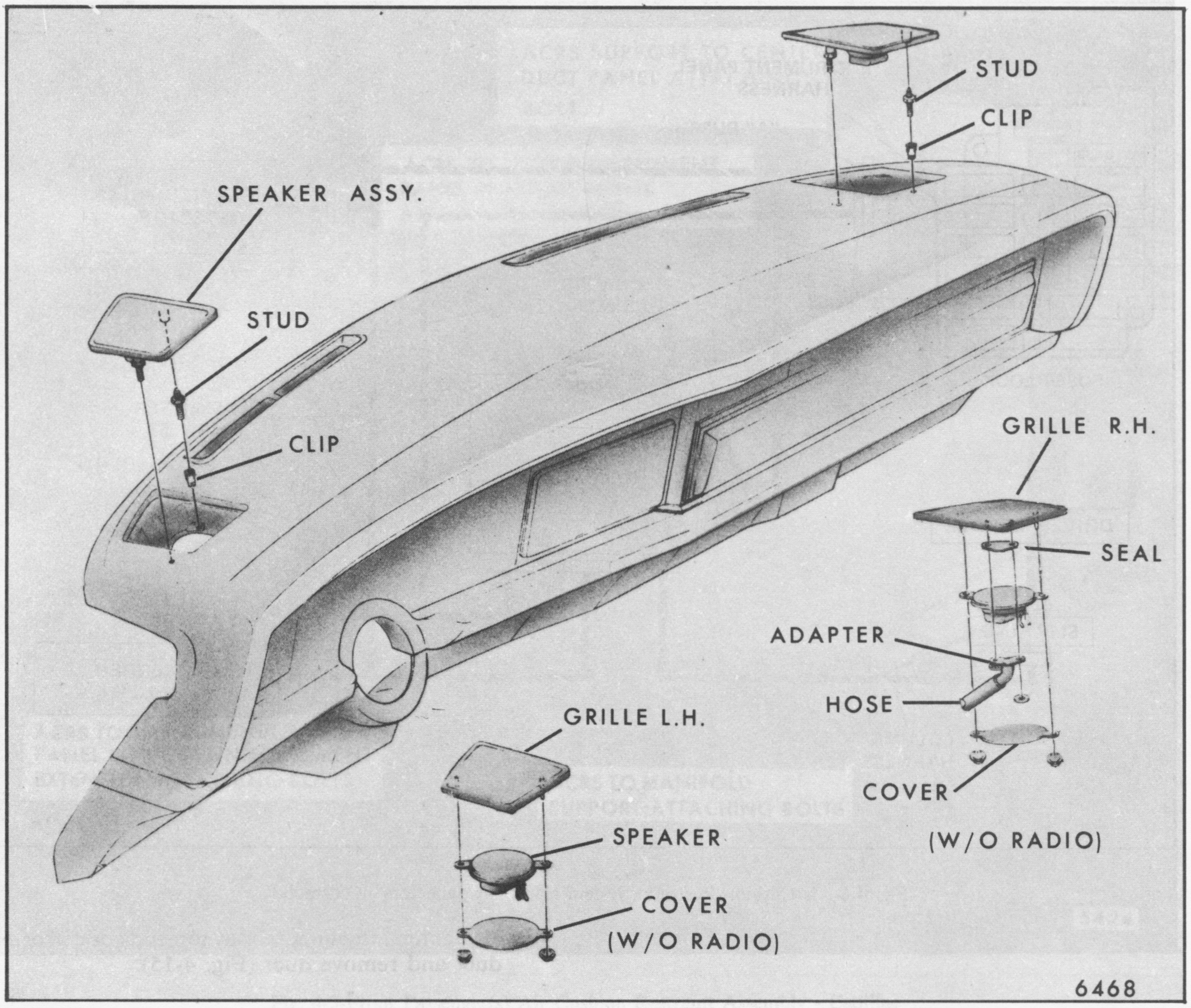


Fig. 4-9-Speaker Attachment - Oldsmobile

a."A" Buss Power Feed

b. Bumper Impulse Detector

c. Passenger Module

d. Sensor-Recorder

20. Remove harness from protective covering.

21. To install, reverse removal procedures.

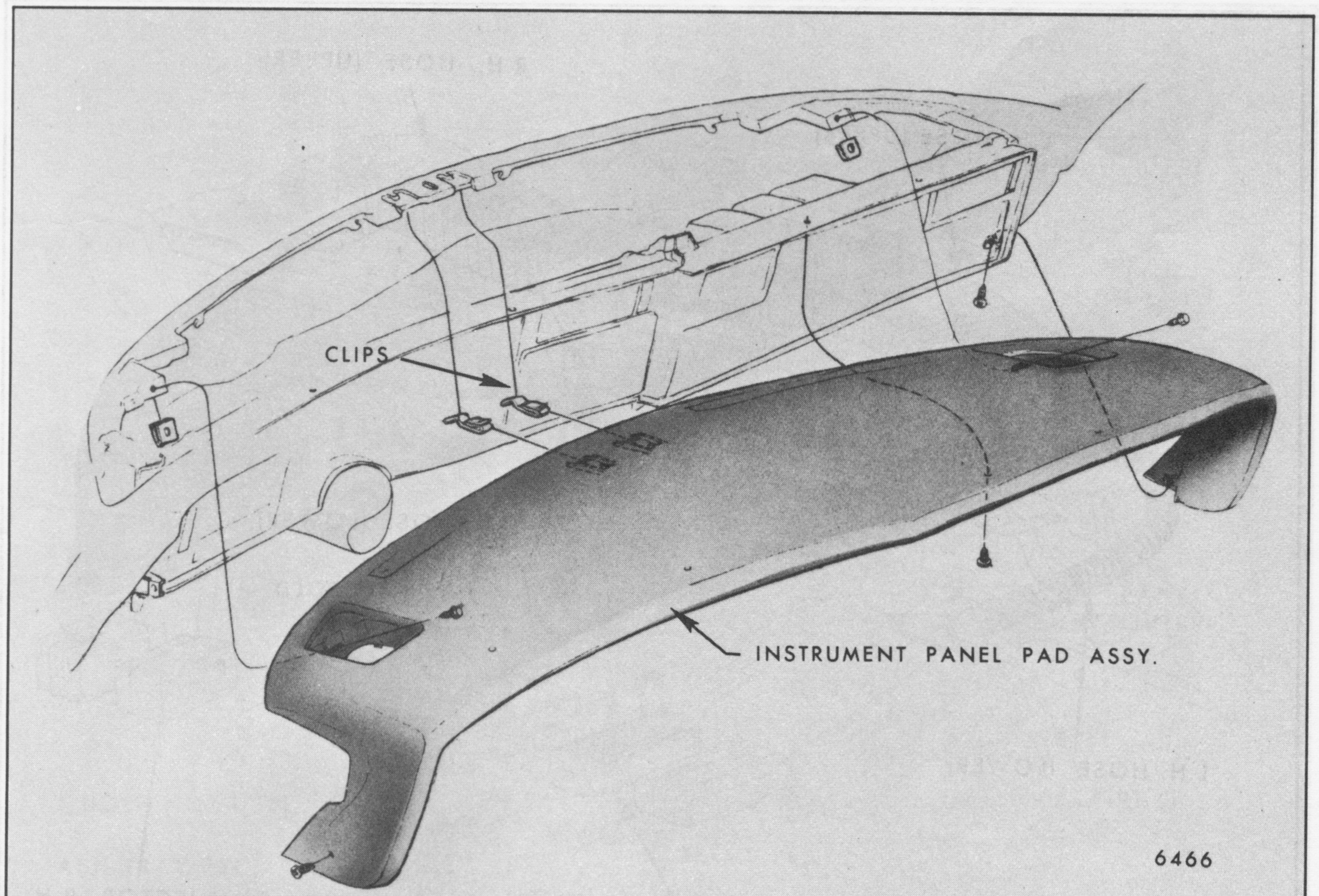


Fig. 4-10-Instrument Panel Pad Assembly - Oldsmobile

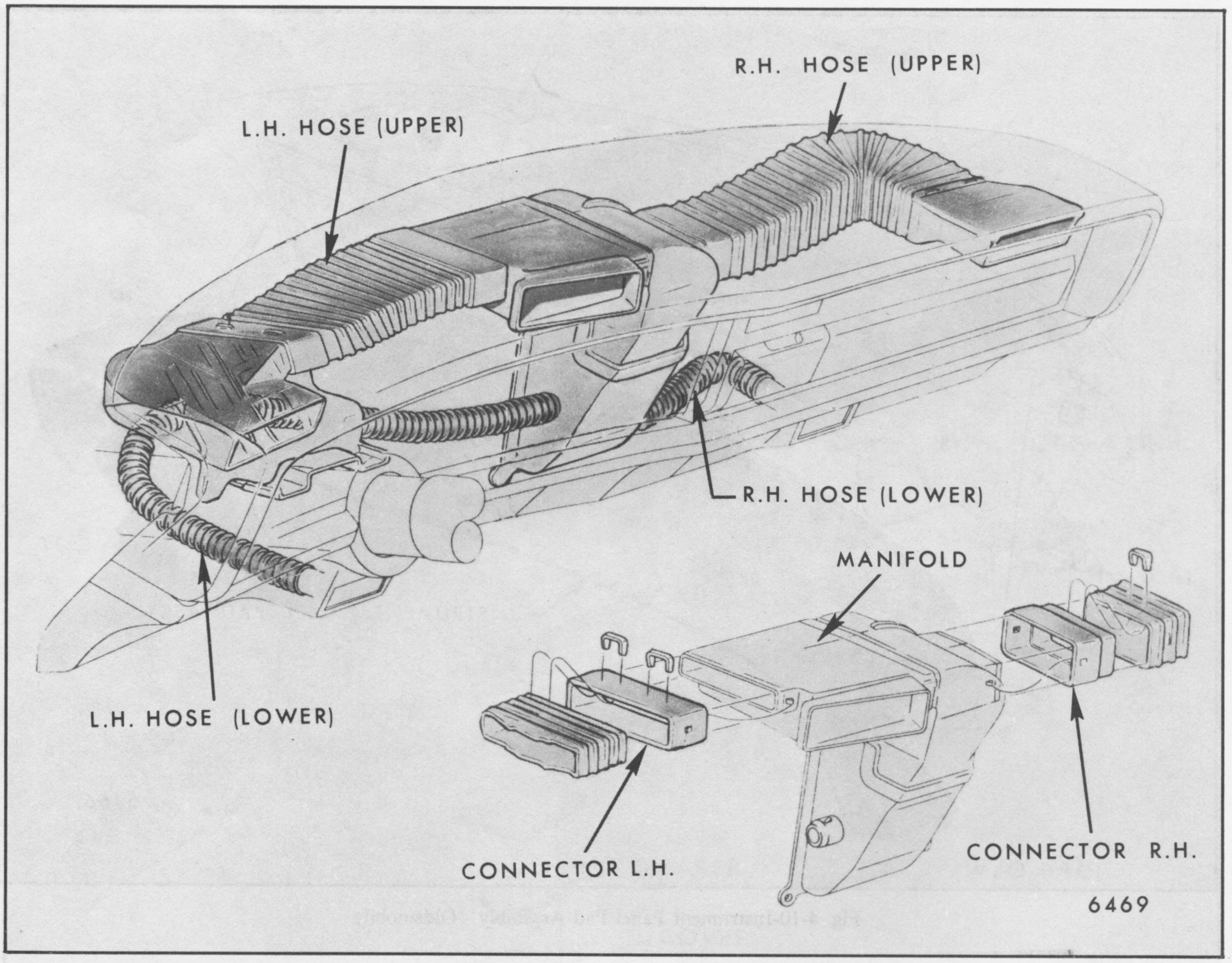


Fig. 4-11-Air Conditioning Hose Routing - Oldsmobile

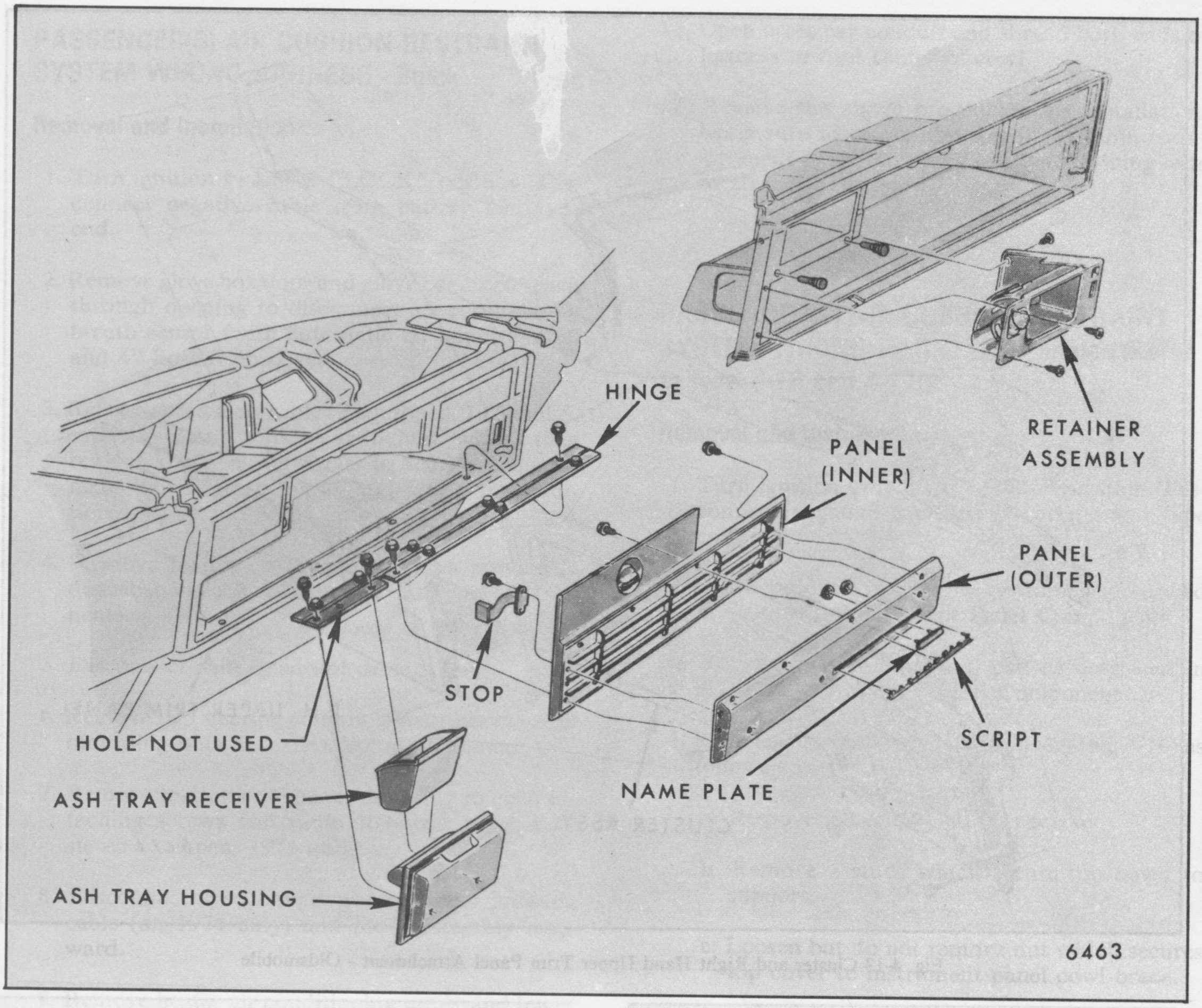


Fig. 4-12-Glove Box Door Attachment - Oldsmobile

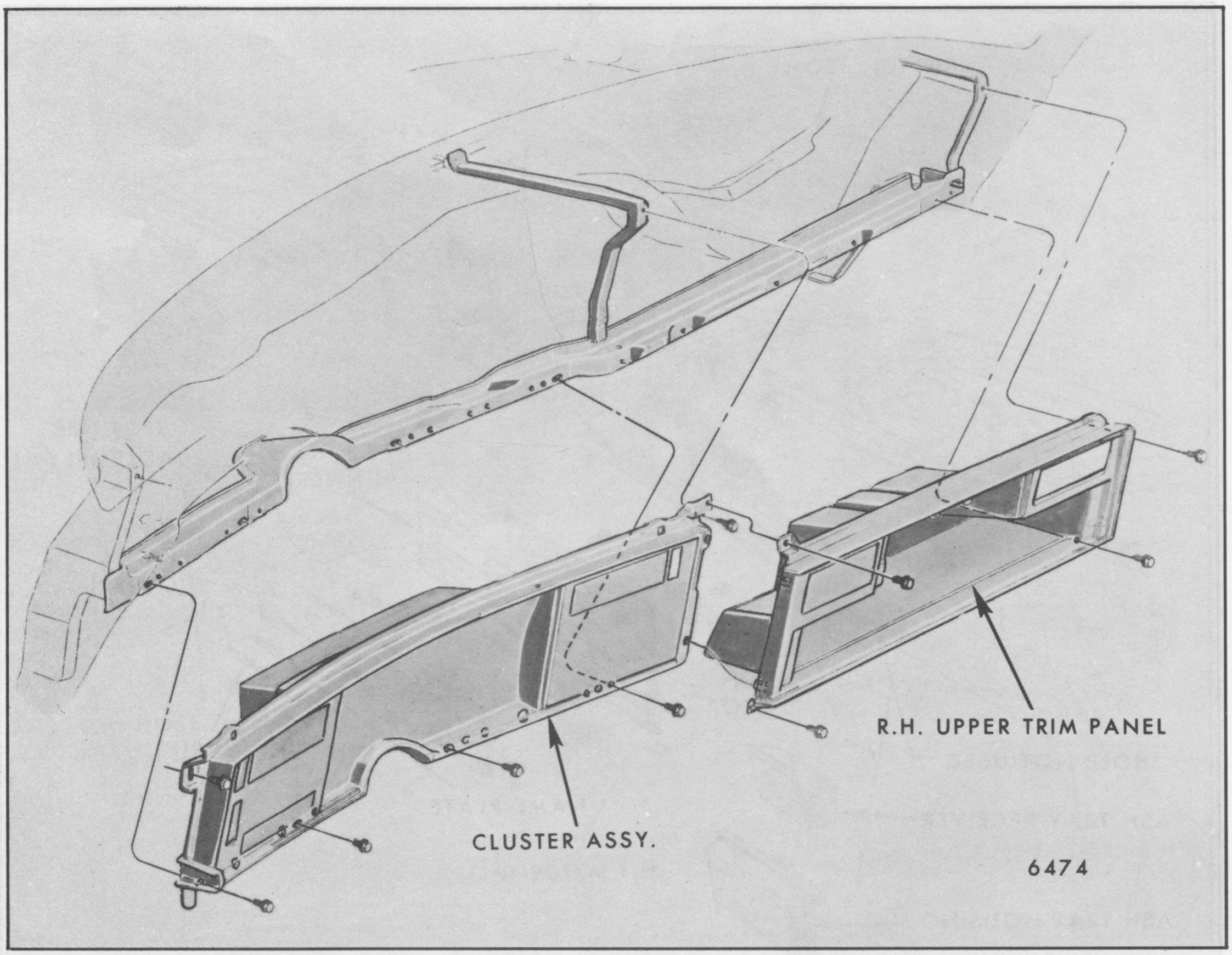


Fig. 4-13-Cluster and Right Hand Upper Trim Panel Attachment - Oldsmobile

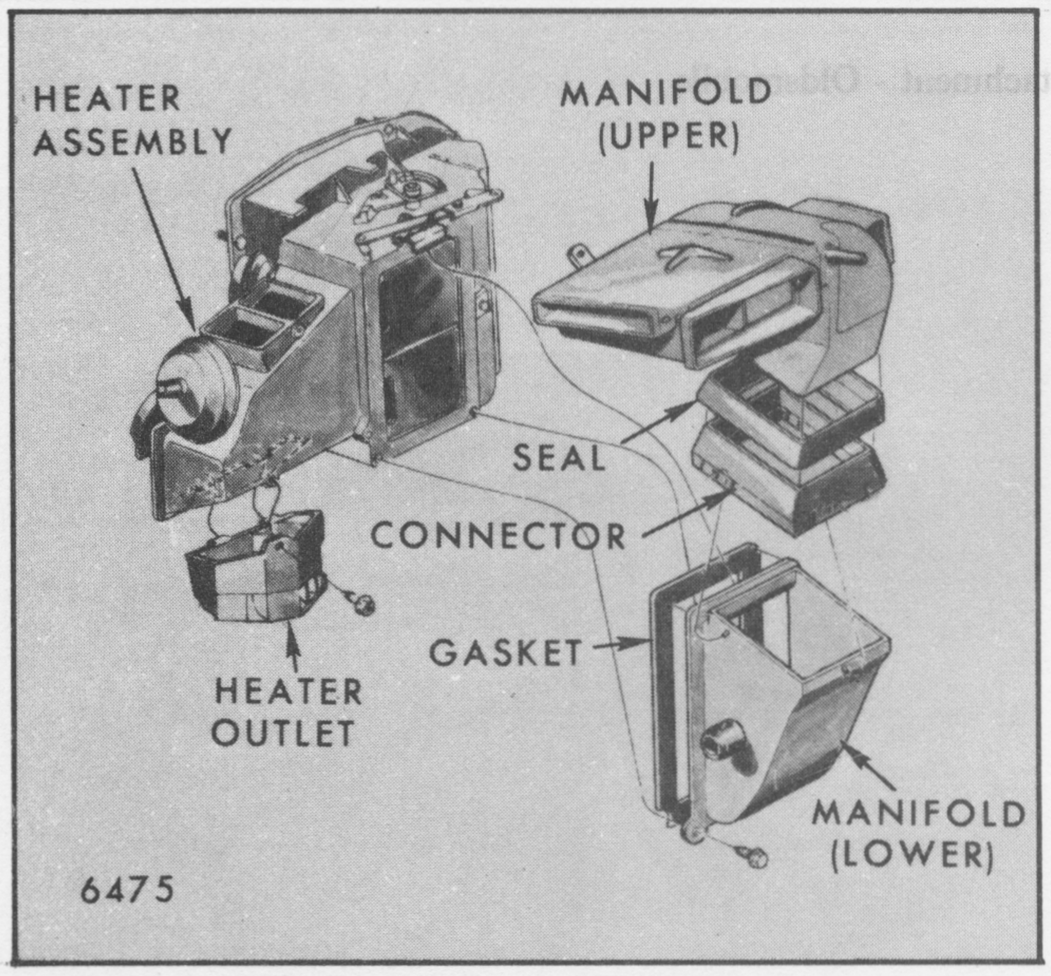


Fig. 4-14-Air Conditioning Manifold - Oldsmobile

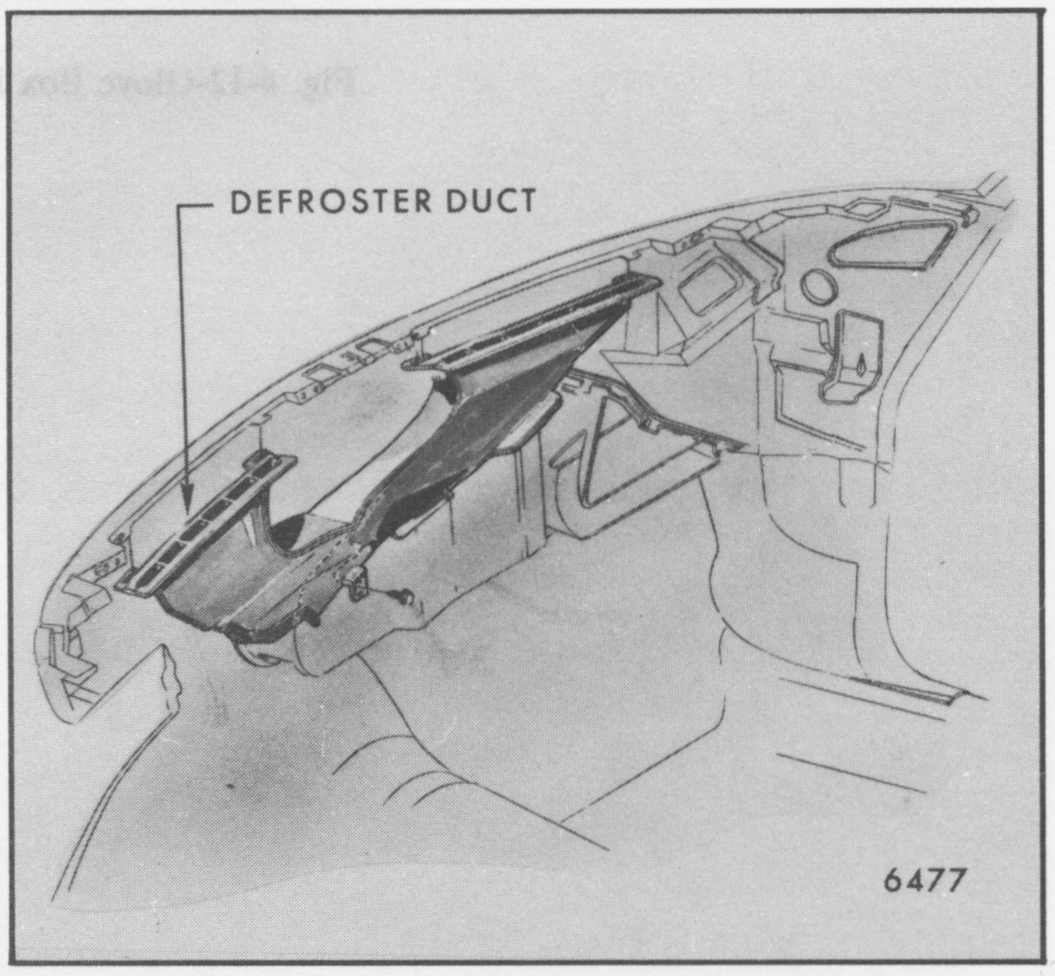


Fig. 4-15-Defroster Duct Attachment

PASSENGER(S) AIR CUSHION RESTRAINT SYSTEM WIRING HARNESS - Buick

Removal and Installation

1. Turn ignition switch to "LOCK" position. Disconnect negative cable from battery and tape end.

2. Remove glove box door and glove box, then reach through opening to disconnect air conditioning breath sensor (with automatic air conditioning) and 4" hose from cover.

3. Release speed alert cable (if equipped, 1974 only), ash tray lamp and cigar lighter wires, then remove knee restraint (refer to Section 2-Instrument Panel Components) and lower air conditioning manifold (1974 only).

4. Remove instrument panel cover as previously described in Section 2- Instrument Panel Components.

5. Disconnect shift quadrant cable.

6. Remove two steering column to instrument panel mounting nuts and allow column to lower.

7. Remove instrument cluster assembly to cowl attaching screws and radio stabilizer bracket (if stereo equipped, 1974 only).

8. Disconnect speedometer cable, power antenna cable (on 1974 only) and move assembly rearward.

9. Remove heater air conditioning upper and lower duct assembly.

10. On 1975 cars, remove instrument panel frame to cowl center diagonal brace.

11. Remove defroster duct lower center cap screw and straighten the four duct outlet to cowl retainer tabs.

12. Remove ground strap from left side sensor mounting bracket.

13. Using tool J-24388 remove center connector from sensor and power feed connector from instrument panel harness connector.

14. Using tool J-24388 disconnect bumper impulse detector cable connector located to the left of the fuse block.

15. Using tool J-24388, remove connector from passenger module.

16. Open cross car conduit and thread both ends of harness toward center of cowl.

17. Reverse the above procedures for installation, being sure to torque the steering column to instrument panel mounting bracket retaining nuts to 20 foot pounds.

PASSENGER(S) AIR CUSHION RESTRAINT SYSTEM WIRING HARNESS - Cadillac (Refer to Figs. 4-16 and 4-17)

Removal and Installation

1. Turn ignition switch to "LOCK" position. Disconnect negative cable from battery and tape end.

2. Remove glove box and knee restraint as described in Section 2- Instrument Panel Components.

3. Remove instrument panel pad as described in Section 2-Instrument Panel Components.

4. Remove instrument panel top cover (Fig. 4-16) as follows:

   a. Remove left and right trim screws.

   b. Remove 2 studs which secure top cover to supports.

   c. Loosen but do not remove nut which secures top cover to instrument panel cowl brace.

      NOTE: Nut is located forward and to the left of clock.

   d. Disconnect the radio speaker connector at radio.

   e. Pull top cover straight out and lift slightly to gain access to and disconnect the following connections:

      1. Printed circuit connector.
      2. Fuel gauge connector and bulb.
      3. Clock connector and bulb.
      4. Climate control in-car sensor connector and aspirator hose.
      5. Twilight sentinel photocell.
      6. Map light connector.

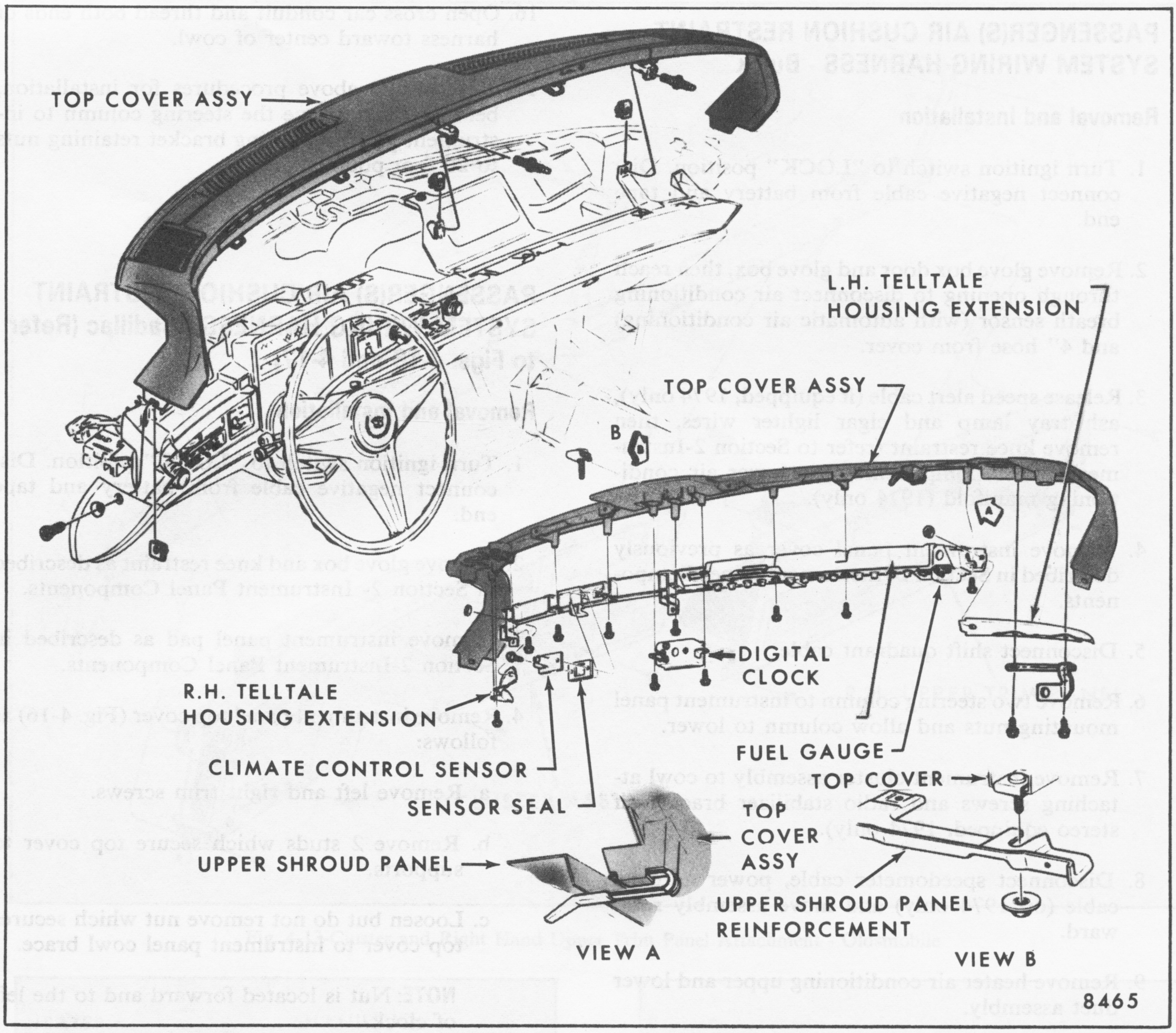


Fig. 4-16-Instrument Panel Top Cover - Cadillac

5. Remove sensor-recorder attaching screws and carefully lower sensor-recorder.

6. Using connector remover tool J-24388 disconnect passenger module wiring harness from sensor-recorder and bumper impulse detector harness.

7. Working through instrument panel pad opening, use connector remover tool J-24388 to disconnect wiring harness from passenger module.

8. Remove air conditioner distributor hose.

9. Straighten tabs on defroster duct and carefully pull duct to gain access to cross car conduit.

10. Carefully remove harness from instrument panel cross car conduit and remove harness from car.

11. To install, reverse removal procedure.

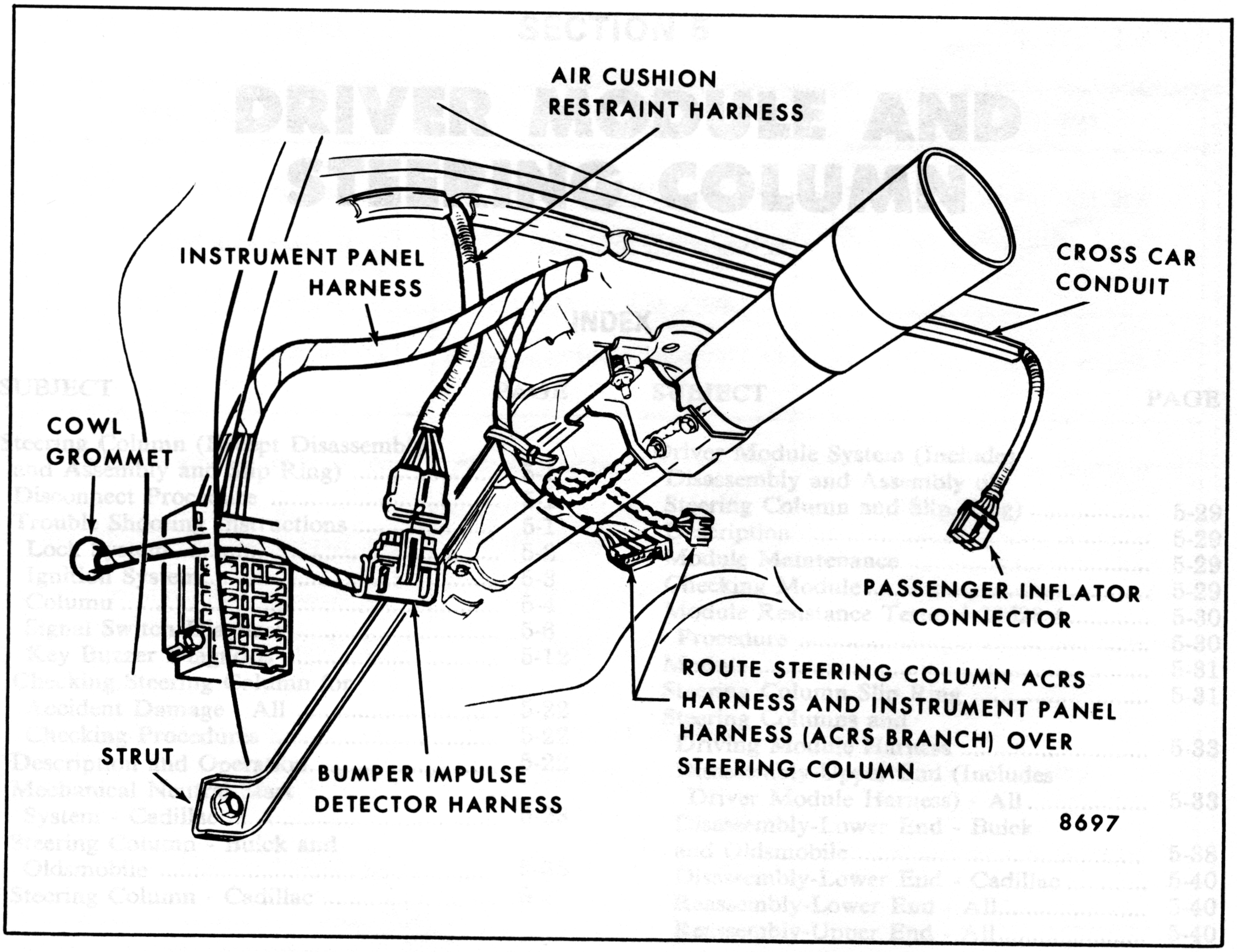
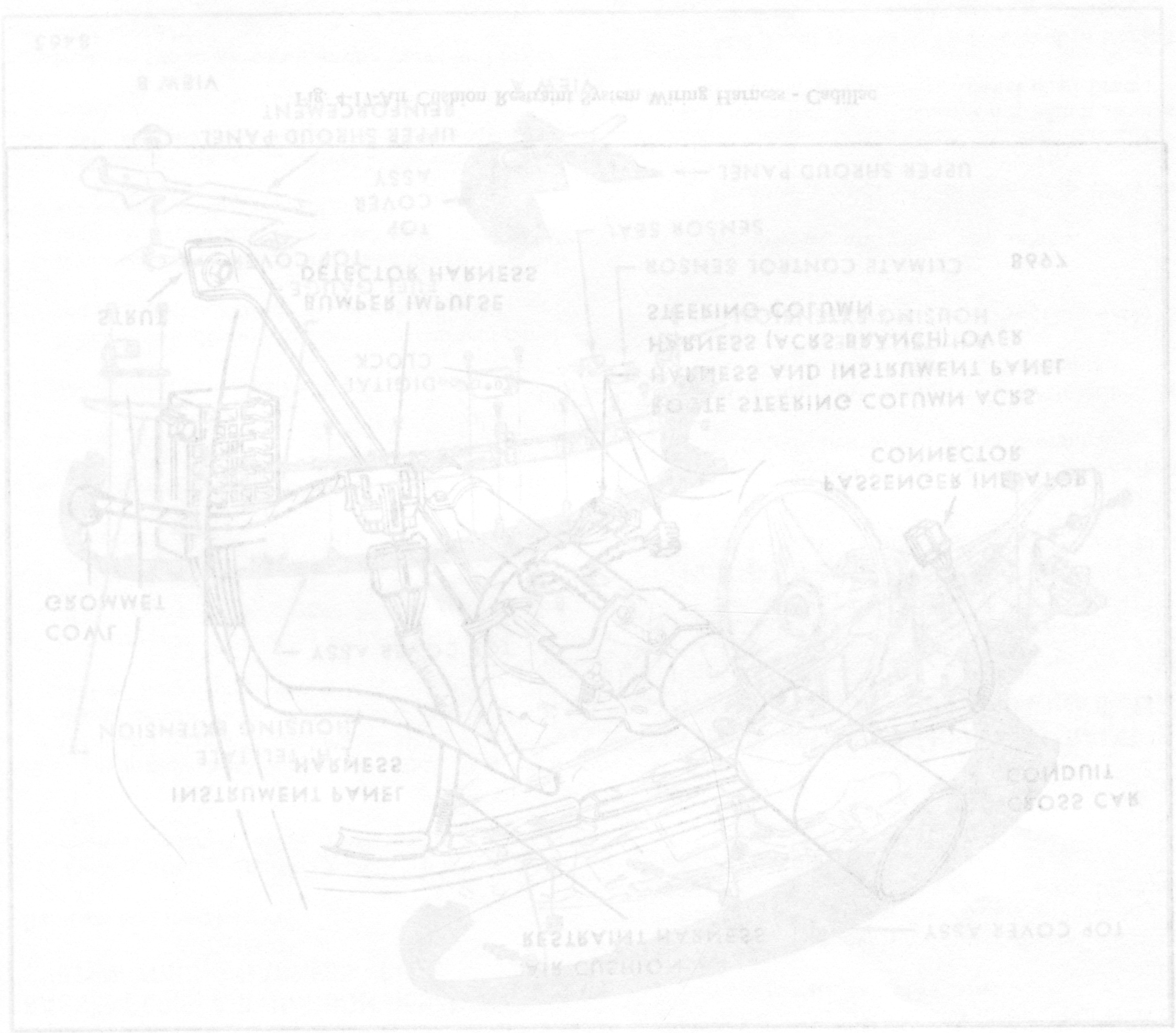


Fig. 4-17-Air Cushion Restraint System Wiring Harness - Cadillac


DETECTOR HARNESS
BUMPER IMPULSE
SPRUT
GROMMET
COWL
INSTRUMENT PANEL
HARNESS
CONNECTOR
PASSENGER INBOARD
CONDUIT
CROSS CAR

SECTION 5

DRIVER MODULE AND STEERING COLUMN

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STEERING COLUMN (Except Disassembly and Assembly and Slip Ring)

DISCONNECT PROCEDURE

WARNING: WITH AIR CUSHION RESTRAINT SYSTEM, DO NOT ATTEMPT ANY ADJUSTMENT, REPAIR OR REMOVAL OF THE STEERING COLUMN AND/OR STEERING WHEEL UNTIL THE DISCONNECTION PROCEDURE IS COMPLETED. THIS PROCEDURE MUST BE FOLLOWED TO PREVENT ACCIDENTAL DEPLOYMENT OF THE SYSTEM WHICH COULD RESULT IN PERSONAL INJURY AND/OR DAMAGE TO THE SYSTEM'S COMPONENTS.

Turn ignition switch to "LOCK" position. Disconnect the negative battery cable from the battery and tape end.

TROUBLE SHOOTING INSTRUCTIONS

This section contains service information to help locate the cause of the column malfunction and for the correct method of column Removal and Installation.

LOCK SYSTEM

CONDITION	POSSIBLE CAUSE	CORRECTION
1. Will not unlock	A. Sector stripped	A. Replace sector
	B. Lock bolt damaged	B. Replace lock bolt
	C. Faulty lock cylinder	C. Replace lock cylinder
	D. Damaged housing	D. Replace housing
2. Will not lock	A. Lock bolt spring broken or faulty	A. Replace lock bolt spring
	B. Damaged sector tooth	B. Replace sector
	C. Faulty lock cylinder	C. Replace lock cylinder
	D. Burr on lock bolt or housing	D. Remove burr
	E. Damaged housing	E. Replace housing
	F. Transmission linkage adjustment incorrect	F. Readjust
	G. Sector installed incorrectly	G. Install correctly
3. High effort	A. Lock cylinder faulty	A. Replace lock cylinder
	B. Ignition switch faulty	B. Replace ignition switch
	C. Rack preload spring broken or deformed	C. Replace rack preload spring
	D. Burrs on sector, rack or housing	D. Remove burr
	E. Bent sector shaft	E. Replace housing assembly
	F. Actuator rod restricted	F. Remove restriction
4. High effort on lock cylinder between "off" and "off-lock"	A. Burr on tang of shift gate	A. Remove burr
	B. Distorted rack	B. Replace rack

LOCK SYSTEM (Continued)

CONDITION	POSSIBLE CAUSE	CORRECTION
5. Will stick in "start"	A. Actuator rod deformed B. Any high effort condition	A. Straighten or replace B. Check items under high effort section
6. Lock bolt hits shaft lock in "off" position and "park"	A. Ignition switch is not set correctly	A. Readjust ignition switch
7. Key can not be removed in "off-lock"	A. Ignition switch is not set correctly B. Faulty lock cylinder	A. Readjust B. Replace lock cylinder
8. Lock cylinder can be removed without depressing retainer	A. Lock cylinder with faulty retainer B. Lock cylinder without retainer C. Burr over retainer slot in housing	A. Replace lock cylinder B. Replace lock cylinder C. Remove burr in housing

IGNITION SYSTEM

CONDITION	POSSIBLE CAUSE	CORRECTION
1. Electrical system will not function	A. Broken fuse in "accessory" circuit B. Connector body loose or broken C. Faulty wiring D. Faulty ignition switch E. Air Cushion Restraint System remains on and problems traced to column	A. Replace fuse B. Tighten or replace C. Repair or replace D. Replace ignition switch E. Replace slip ring and/or cable. Slip ring serviced as a unit NOTE: Problem may be in Air Cushion Restraint System module in steering wheel

IGNITION SYSTEM (Continued)

CONDITION	POSSIBLE CAUSE	CORRECTION
2. Switch will not actuate mechanically	A. Faulty ignition switch	A. Replace ignition switch
3. Switch cannot be set correctly	A. Switch actuator rod deformed	A. Repair or replace switch actuator rod

COLUMN

CONDITION	POSSIBLE CAUSE	CORRECTION
1. Noise in column	A. Coupling bolts not tightened	A. Tighten pinch bolts to 30 foot pounds Tighten coupling bolts to specified torque. (Parts should be inspected for damage before reassembling. If serrations or threads are damaged, replace parts)
	B. Column not correctly aligned	B. Realign column
	C. Coupling pulled apart	C. Realign column and replace coupling. Broken intermediate shaft plastic injected joint. If intermediate shaft is damaged, replace - if not, repair joint using repair kit 7810077.
	D. Horn contact ring not lubricated	D. Lubricate with Lubriplate
	E. Lack of grease on bearings or bearing surface	E. Lubricate
	F. Lower shaft bearing tight or frozen	F. Replace bearing. Check shaft and replace if scored
	G. Upper shaft bearing tight or frozen	G. Replace housing assembly

COLUMN (Continued)

CONDITION	POSSIBLE CAUSE	CORRECTION
	H. Shaft lock plate cover loose	H. Make sure wave washer properly installed so as to put pressure on cover. Tighten three screws to 15 inch pounds CAUTION: Use specified screws
	I. Lock plate retaining ring not seated	I. Replace retaining ring Check for proper seating in groove
	J. Slip ring noise	J. Some slip ring noise is normal. Do not lubricate or disassemble slip ring assembly to eliminate excessive noise. Replace slip ring assembly
2. One click when in "off-lock" position and the steering wheel is moved		A. None - normal - lock bolt is seating
3. High steering shaft effort	A. Column assembly misaligned in vehicle	A. Align correctly
	B. Improperly installed or deformed dust seal	B. Replace dust seal
	C. Tight or frozen upper or lower bearings	C. Replace
4. High shift effort	A. Column not aligned correctly in car	A. Realign
	B. Lower bowl bearing not aligned correctly	B. Reassemble correctly
	C. Improperly installed dust seal	C. Remove and replace
	D. Lack of grease on seal or bearing areas	D. Lubicate

COLUMN (Continued)

CONDITION	POSSIBLE CAUSE	CORRECTION
5. Improper transmission shifting	A. Sheared shift tube joint	A. Replace shift tube assembly
	B. Improper transmission linkage adjustment	B. Readjust
	C. Loose lower shift lever	C. Replace shift tube assembly
	D. Improper gate plate	D. Replace with correct part
6. Miscellaneous	A. Shroud loose on shift bowl	A. Bend tabs on shroud over lugs on bowl
	B. Housing loose on jacket - will be noticed with ignition in "off-lock" and a torque applied to the steering wheel	B. Tighten four mounting screws (60 inch pounds)
7. Lash in mounted column assembly	A. Instrument panel bracket to instrument panel mounting bolts loose	A. Tighten to 20 foot pounds
	B. Broken weld nuts on jacket	B. Replace jacket assembly
	C. Instrument panel bracket capsule sheared	C. Replace bracket assembly
	D. Instrument panel bracket to jacket mounting bolts loose	D. Tighten to 15 foot pounds
	E. Column lower clamp loose	E. Tighten clamp

SIGNAL SWITCH DIAGNOSIS

CONDITION	POSSIBLE CAUSE	CORRECTION
1. Turn signal will not cancel	A. Loose switch mounting screws	A. Tighten to specified torque (25 inch pounds)
	B. Switch or anchor bosses broken	B. Replace switch

SIGNAL SWITCH DIAGNOSIS (Continued)

CONDITION	POSSIBLE CAUSE	CORRECTION
	C. Broken, missing or out of position detent, return or cancelling spring	C. Reposition or replace springs as required
	D. Uneven or incorrect cancelling cam to cancelling spring interference (.120) side	D. Adjust switch position 1. If interference is correct and switch will not cancel, replace switch 2. If interference cannot be corrected by switch adjustment, replace cancelling cam
2. Turn signal difficult to operate	A. Actuator rod loose	A. Tighten mounting screw (12 inch pounds)
	B. Yoke broken or distorted	B. Replace switch
	C. Loose or misplaced springs	C. Reposition or replace springs
	D. Foreign parts and/or materials	D. Remove foreign parts and/or materials
	E. Switch mounted loosely	E. Tighten mounting screws (25 inch pounds)
3. Turn signal will not indicate lane change	A. Broken lane change pressure pad or spring hanger	A. Replace switch
	B. Broken, missing or misplaced lane change spring	B. Replace or reposition as required
	C. Jammed base or wires	C. Loosen mounting screws, reposition base or wires and retighten screws (25 inch pounds)
4. Turn signal will not stay in turn position	A. Foreign material or loose parts impeding movement of yoke	A. Remove material and/or parts

SIGNAL SWITCH DIAGNOSIS (Continued)

CONDITION	POSSIBLE CAUSE	CORRECTION
	B. Broken or missing detent or cancelling springs	B. Replace spring
	C. None of the above	C. Replace switch
5. Hazard switch cannot be turned off	A. Foreign material between hazard support cancelling leg and yoke	A. Remove foreign material 1. No foreign material impeding function of hazard switch - replace turn signal switch
6. Hazard switch will not stay on or difficult to turn off	A. Loose switch mounting screws	A. Tighten mounting screws (25 inch pounds)
	B. Interference with other components	B. Remove interference
	C. Foreign material	C. Remove foreign material
	D. None of the above	D. Replace switch
7. No turn signal lights	A. Faulty or blown fuse	A. Replace fuse
	B. Inoperative turn signal flasher	B. Replace turn signal flasher
	C. Loose chassis to column connector	C. Connect securely
	D. Disconnect column to chassis connector. Connect new switch to chassis and operate switch by hand If vehicle lights now operate normally, signal switch is inoperative	D. Replace signal switch
	E. If vehicle lights do not operate check chassis wiring for opens, grounds, etc.	E. Repair chassis wiring as required using manual as guide

SIGNAL SWITCH DIAGNOSIS (Continued)

CONDITION	POSSIBLE CAUSE	CORRECTION
8. Turn indicator lights on, but not flashing	A. Inoperative turn flasher	A. Replace turn flasher NOTE: There are two flashers in the system
	B. Loose chassis to column connection	B. Connect securely
	C. Inoperative turn signal switch	C. Replace turn signal switch
	D. To determine if turn signal switch is inoperative, substitute new switch into circuit and operate switch by hand. If the vehicle's lights operate normally, signal switch is inoperative	D. Replace signal switch
	E. If the vehicle's lights do not operate, check light sockets for high resistance connections, the chassis wiring for opens, grounds, etc.	E. Repair chassis wiring as required
9. Front or rear turn signal lights not flashing	A. Burned out or damaged turn signal bulb	A. Replace bulb
	B. High resistance connection to ground at bulb socket	B. Remove or repair defective connection
	C. Loose chassis to column connector	C. Connect securely
	D. Disconnect column to chassis connector. Connect new switch into system and operate switch by hand. If turn signal lights are now on and flash, turn signal switch is inoperative	D. Replace turn signal switch

SIGNAL SWITCH DIAGNOSIS (Continued)

CONDITION	POSSIBLE CAUSE	CORRECTION
	E. If vehicle lights do not operate, check chassis wiring harness to light sockets for opens, grounds, etc.	E. Repair chassis wiring as required
10. Stop light not on when turn indicated	A. Loose column to chassis connection	A. Connect securely
	B. Disconnect column to chassis connector. Connect new switch into system without removing old. Operate switch by hand. If brake lights work with switch in the turn posiiton, signal switch is defective	B. Replace signal switch
	C. If brake lights do not work check connector to stop light sockets for grounds, opens, etc.	C. Repair connector to stop light circuits
11. Turn indicator panel lights not flashing	A. Burned out bulbs	A. Replace bulbs
	B. High resistance to ground at bulb socket	B. Replace socket
	C. Opens, grounds in wiring harness from front turn signal bulb socket to indicator lights	C. Locate and repair as required
12. Turn signal lights flash very slowly	A. Inoperative turn signal flasher	A. Replace turn signal flasher
	B. System charging voltage low	B. Increase voltage to specified
	C. High resistance ground at light sockets	C. Repair high resistance grounds at light sockets

SIGNAL SWITCH DIAGNOSIS (Continued)

CONDITION	POSSIBLE CAUSE	CORRECTION
	D. Loose chassis to column connection	D. Connect securely
	E. Disconnect column to chassis connector. Connect new switch into system without removing old. Operate switch by hand. If flashing occurs at normal rate, the signal switch is faulty	E. Replace signal switch
	F. If the flashing rate is still extremely slow, check chassis wiring harness from the connector to light sockets for grounds, high resistance points, etc.	F. Locate and repair as required
13. Hazard signal lights will not flash - turn signal functions normally	A. Blown fuse	A. Replace fuse
	B. Inoperative hazard warning flasher	B. Replace hazard warning flasher
	C. Loose chassis to column connection	C. Connect securely
	D. Disconnect column to chassis connector. Connect new switch into system without removing old. Depress the hazard warning button and observe the hazard warning lights. If they now work normally, the turn signal switch is faulty	D. Replace the turn signal switch
	E. If the lights do not flash, check wiring harness "K" lead (brown) for open between hazard flasher and harmonica connector. If open, fuse block is faulty	E. Replace fuse block

KEY BUZZER DIAGNOSIS

CONDITION	POSSIBLE CAUSE	CORRECTION
1. Buzzer does not sound with key fully inserted in lock cylinder with the driver's door open	A. Faulty buzzer	A. Replace buzzer
	B. Bad connection at buzzer	B. Connect securely
	C. Power not available to buzzer	C. Check continuity of chassis wiring and repair as required
	D. Door jamb switch on driver's side misadjusted or inoperative	D. Readjust or replace - as required
	E. Short in chassis wiring NOTE 1. If the buzzer fault has not yet been detected, connect a continuity meter (light) to the male "E" and "F" connector contacts (Fig. 5-2). Insert the key the full depth into the lock cylinder. If contact is made with the key in, and is not made with it out, the function is normal. Re-trace initial diagnostic steps. If contact is not established, the fault is in the column. Proceed to Note 2. NOTE 2. With the fault isolated in the column, disassemble the upper end of the column until the signal switch mounting screws have been removed. Lift the switch and check the probes of the buzzer switch to insure good contact with the pads on the signal switch. Bend probes, if required, then reseat the signal switch and drive the three screws. Check the function, as in Note 1.	E. Check by separating chassis to column connector. Connect "E" (black) and "F" (black w/pink stripe) female contacts on the chassis side (Fig. 5-1). Bent paper clip will work if buzzer sounds, continue diagnosis. If not, locate and repair chassis wiring, use manual as guide

KEY BUZZER DIAGNOSIS (Continued)

CONDITION	POSSIBLE CAUSE	CORRECTION
	F. Short or fault in signal switch wiring NOTE 3. If the fault has not yet been isolated and repaired, connect a continuity meter to the buzzer switch probes (Fig. 5-3). Fully insert and remove the key from the lock cylinder. If contact is made with the key in, and is broken with it out, the function is normal. Retrace diagnostic steps starting at Note 2. If contact is not made, the fault is in the lock cylinder or buzzer switch	F. Connect male "E" and "F" contacts of connector with jumper (Fig. 5-4). Check buzzer switch pads with continuity meter. If contact is made, function is normal. If not, replace signal switch.
	G. Chips, burrs, foreign material preventing actuator tip function CAUTION: Key must be removed or cylinder in "run" position before removing lock cylinder	G. Remove chips, burrs, etc. Reassemble and recheck ref. Note 3.
	H. Faulty lock cylinder	H. With the lock cylinder out (observing caution under G), fully insert and remove the key. The actuator (Figs. 5-5 and 5-6) should extend and retract smoothly. Total extension of tip should be .050 inches. If not, replace lock cylinder
	I. Chips, foreign material affecting buzzer switch operation	I. Remove and clean as required - reassemble and recheck per Note 3.
	J. Damaged or broken buzzer switch	J. Replace buzzer switch
	K. Switch appears good but will not make buzzer switch function check	K. Connect continuity meter leads to the buzzer switch probes. Press on the actuator pad until the interior points contact (Fig. 5-7). If contact is not made, replace buzzer switch

KEY BUZZER DIAGNOSIS (Continued)

CONDITION	POSSIBLE CAUSE	CORRECTION
	L. Buzzer switch contact gap too large NOTE 4. Setting the contact gap. Press a .030 inches wire type spark plug gap wire with flat piece of stock on the actuator pad (Fig. 5-8). If contact is not made adjust switch as shown in Figure 5-9, until positive contact is made. (Use continuity meter) With positive contact at .030 inches, use a .025 inches plug gap wire beneath the flat stock (Fig. 5-10). No contact should occur. Adjust as shown in Figure 5-11. When the switch will make contact with the .030 inches wire and not with the .025 inches, the buzzer switch is set at the low limit	L. Reset contact gap
2. Buzzer continues to operate with key in the lock cylinder with the driver's door either opened or closed and ceases when key is removed	A. Door jamb switch on driver's side misadjusted or inoperative B. Wire from signal switch to door jamb switch shorted NOTE 5. This condition indicates the lock cylinder or buzzer switch is at fault. To verify, check for continuity at the "E" and "F" male connector contacts with the key removed from the cylinder (Fig. 5-2). If continuity exists, the fault is in the column	A. Adjust or replace as required B. If on signal switch side, replace signal switch. If on chassis side, find and repair

KEY BUZZER DIAGNOSIS (Continued)

CONDITION	POSSIBLE CAUSE	CORRECTION
3. Buzzer continues to operate with key out, but stops when driver's door is closed	A. Turn lock towards "start" position. buzzer stops in "run" position or when turned past "run" towards "start", the problem is a sticky lock cylinder actuator	A. Replace lock cylinder
	B. Chips, foreign material in lock cylinder bore	B. Remove, reassembly and recheck function
	C. Sticky lock cylinder actuator tip	C. Replace lock cylinder
	D. Damaged or broken buzzer switch	D. Replace buzzer switch
	E. Buzzer switch contact gap too close	E. Adjust as specified

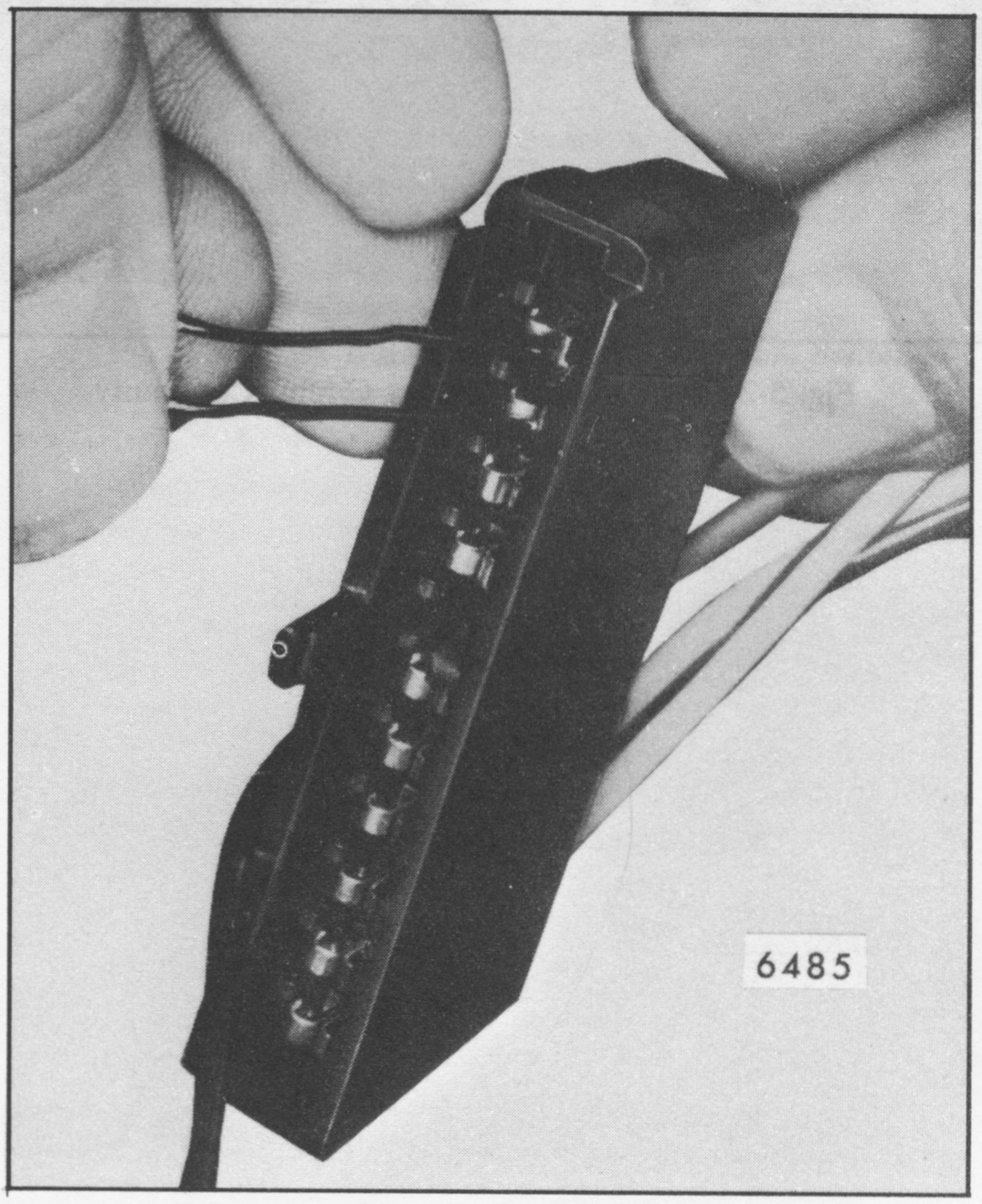

Fig. 5-1-Check For Short in Chassis Wiring

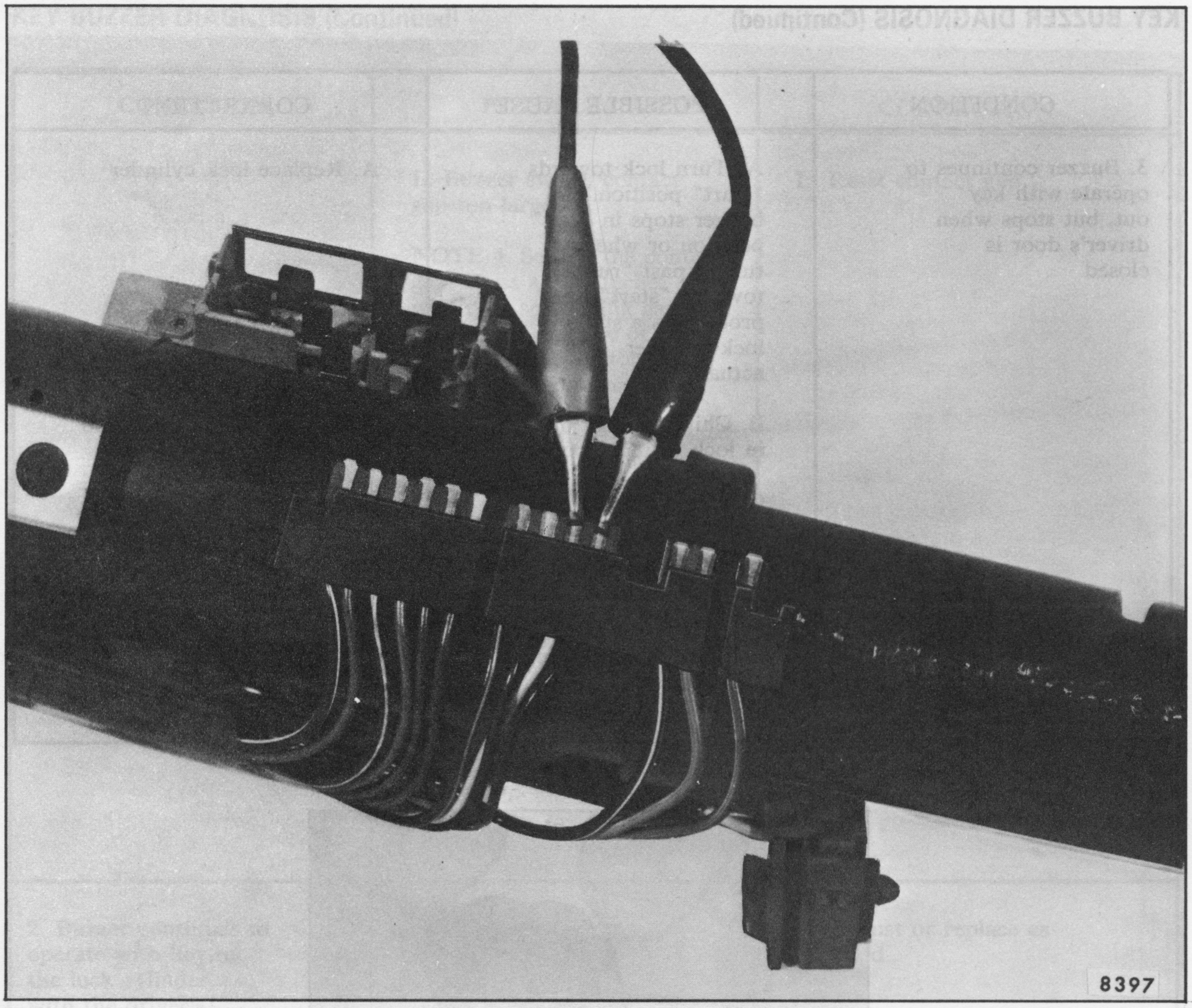

Fig. 5-2-Check Column Buzzer Circuit Continuity

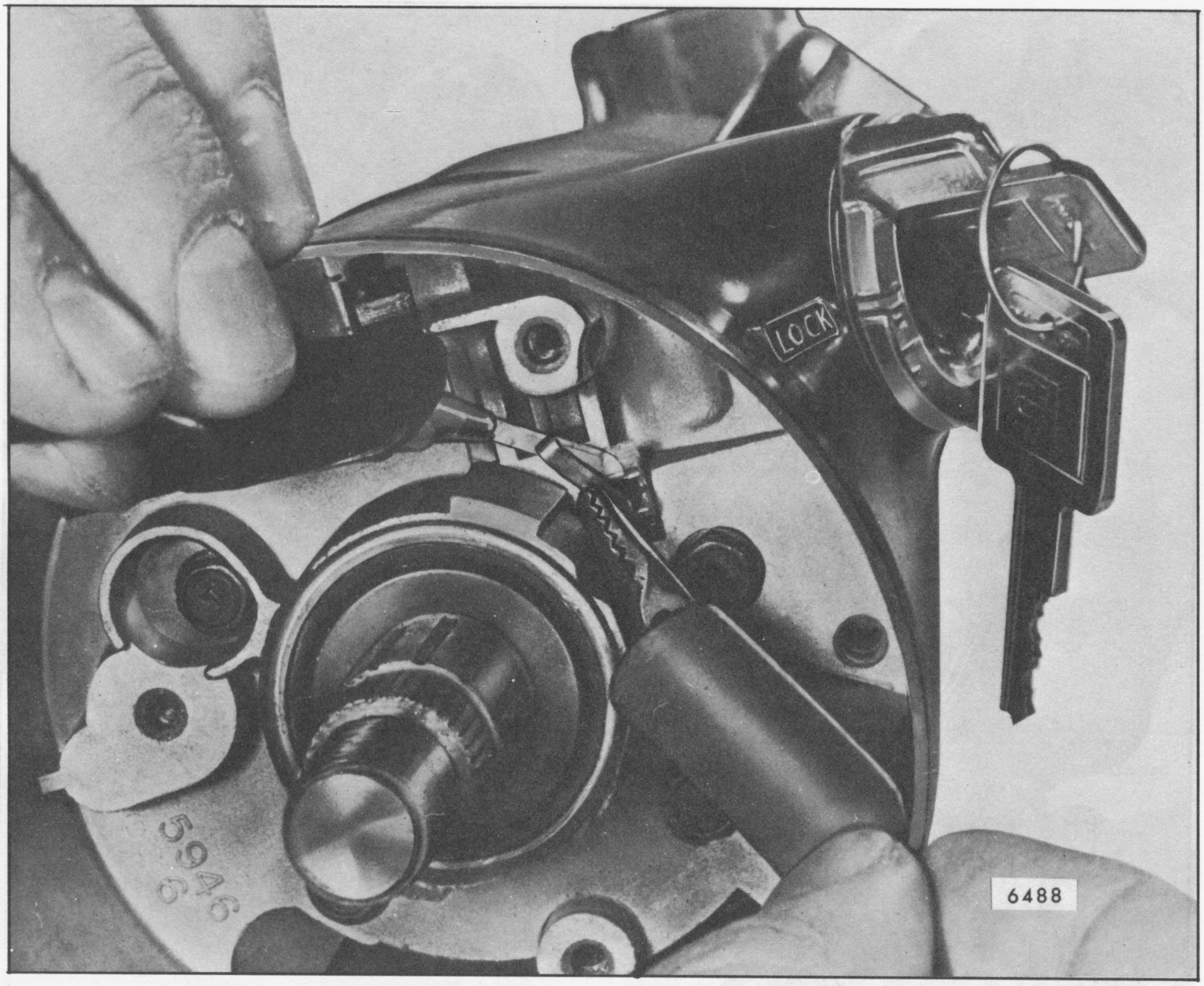

Fig. 5-3-Check Buzzer Switch Pads on Signal Switch

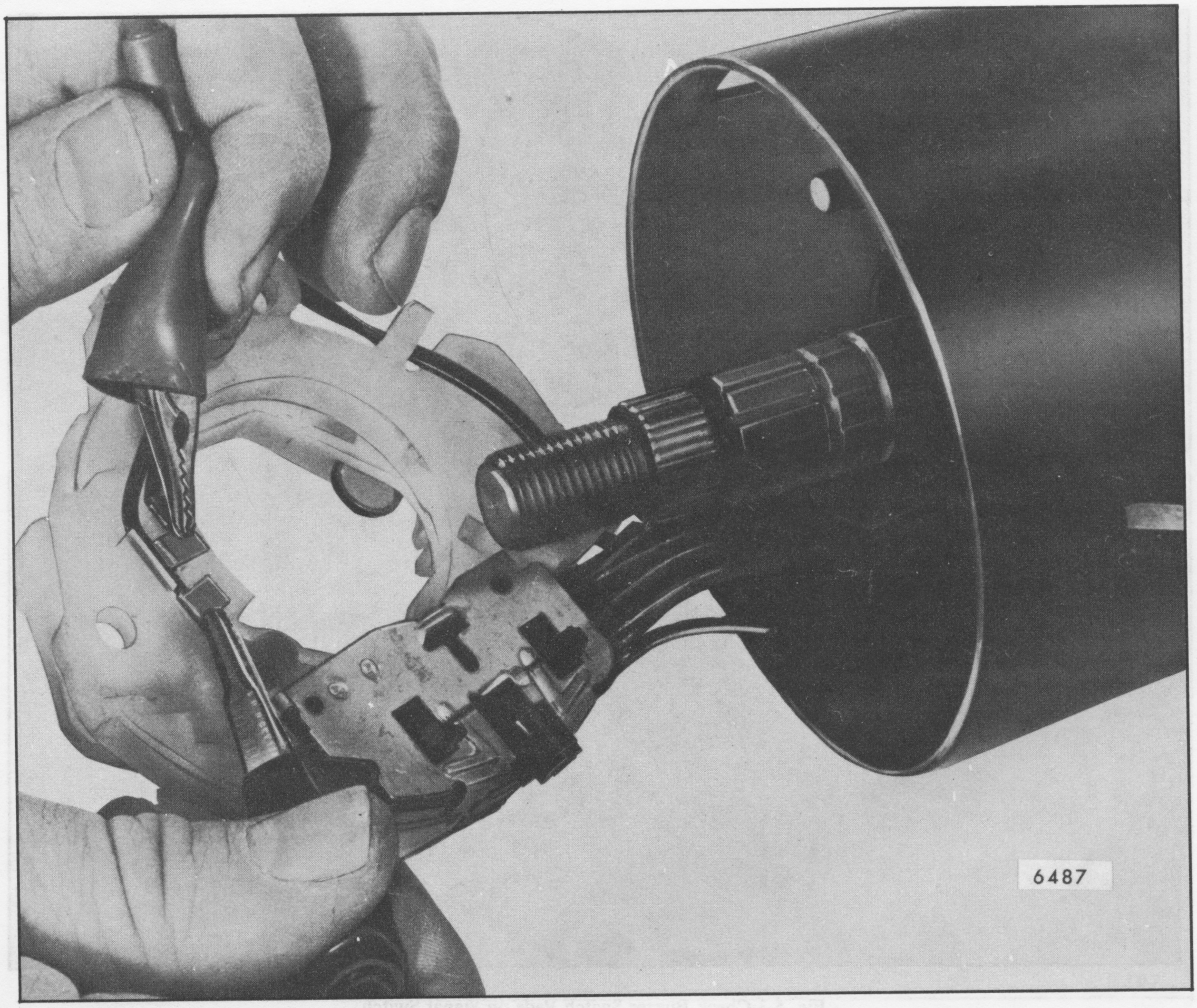

Fig. 5-4-Check Buzzer Switch Continuity

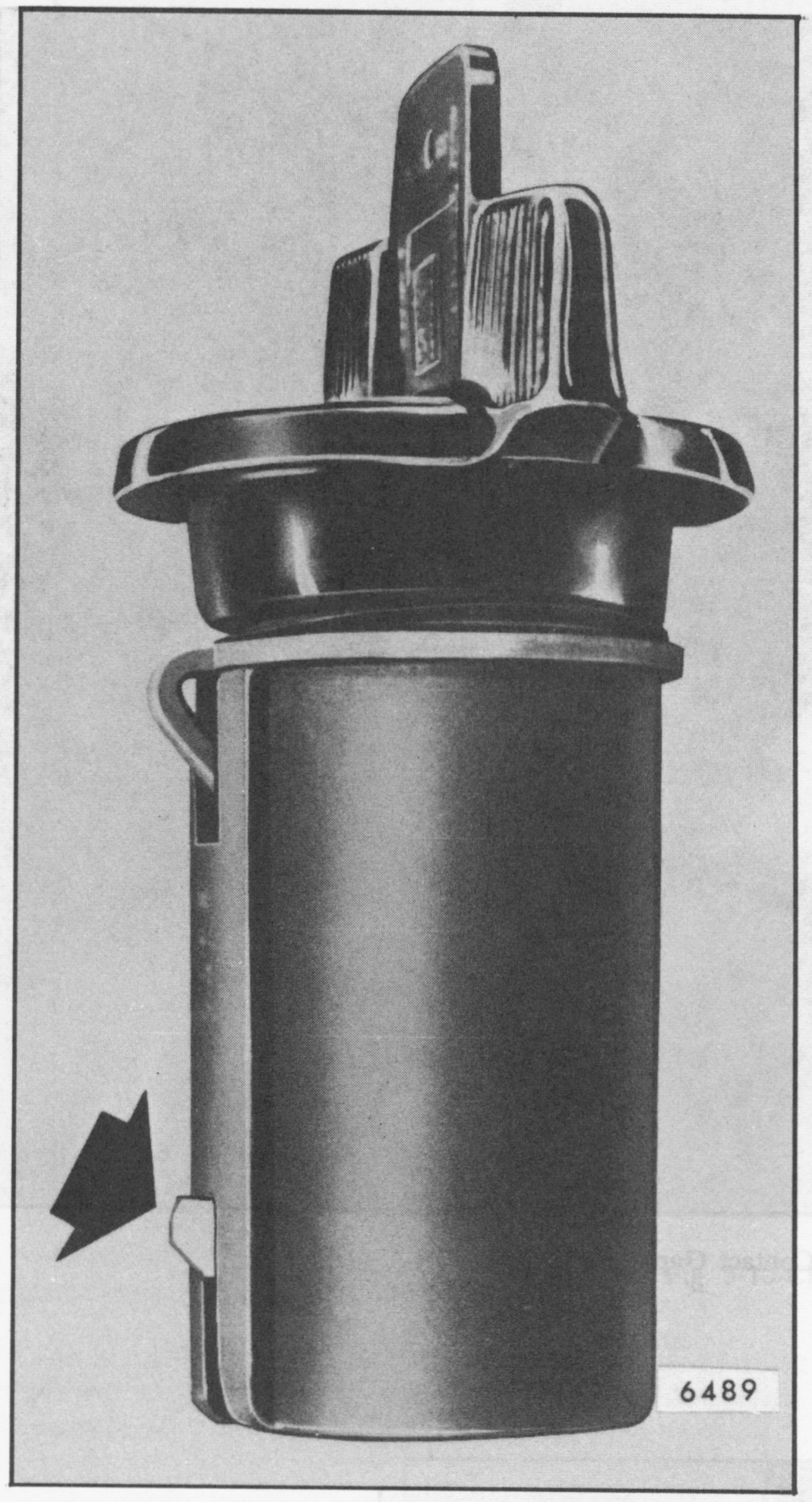

Fig. 5-5-Key In Lock Cylinder - Actuator Extended

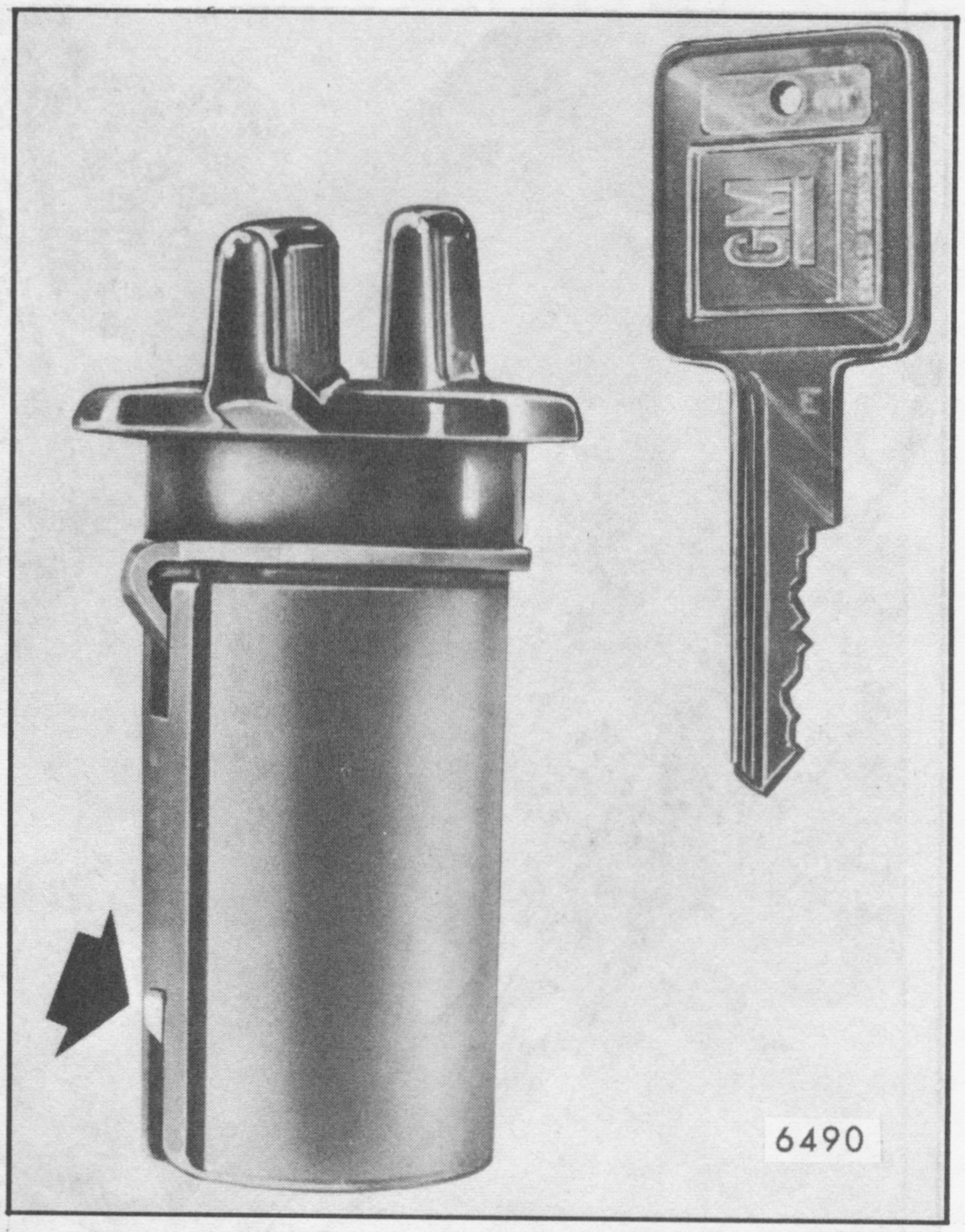

Fig. 5-6-Key Out of Lock Cylinder - Actuator Retracted

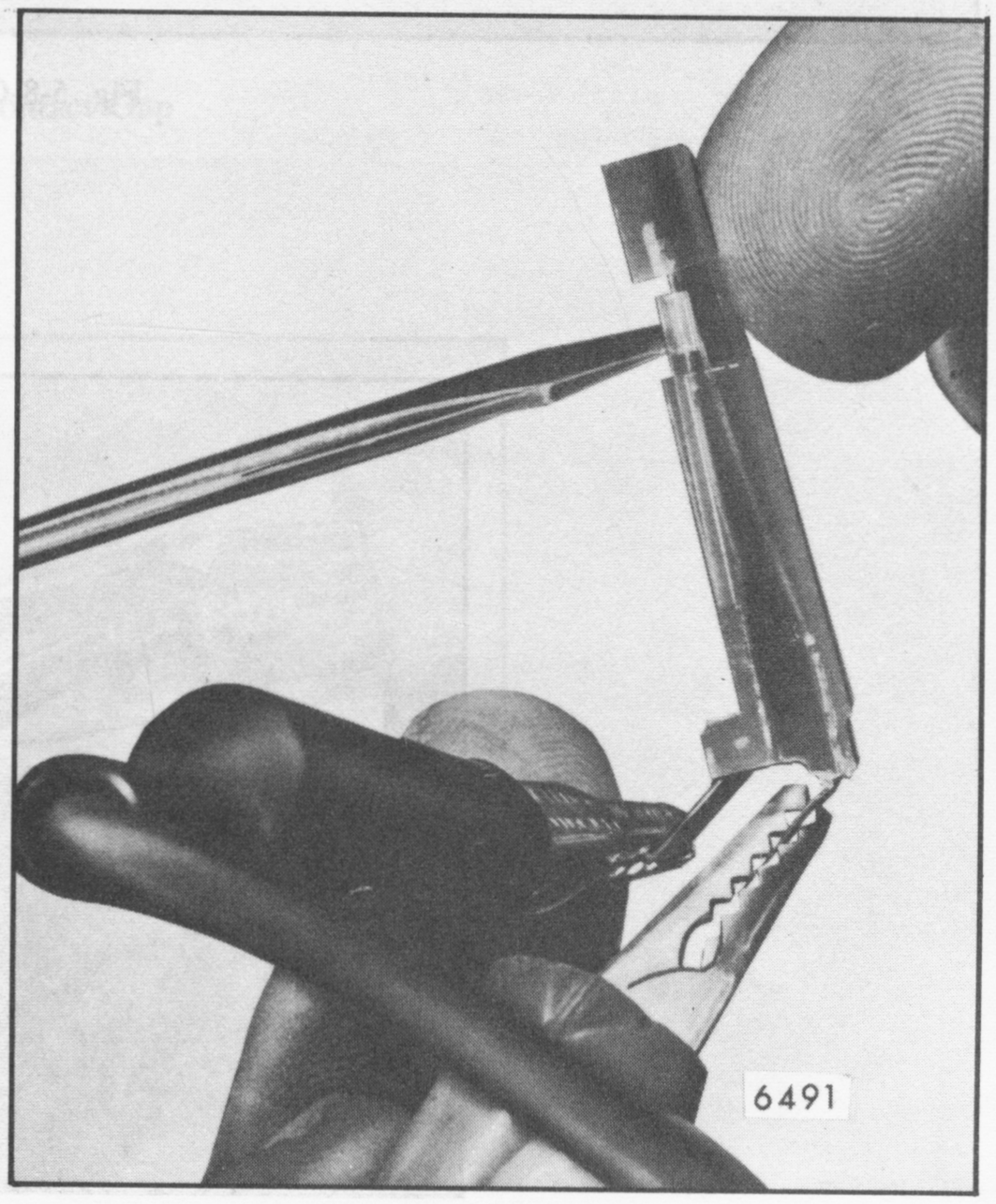

Fig. 5-7-Check Buzzer Switch Continuity

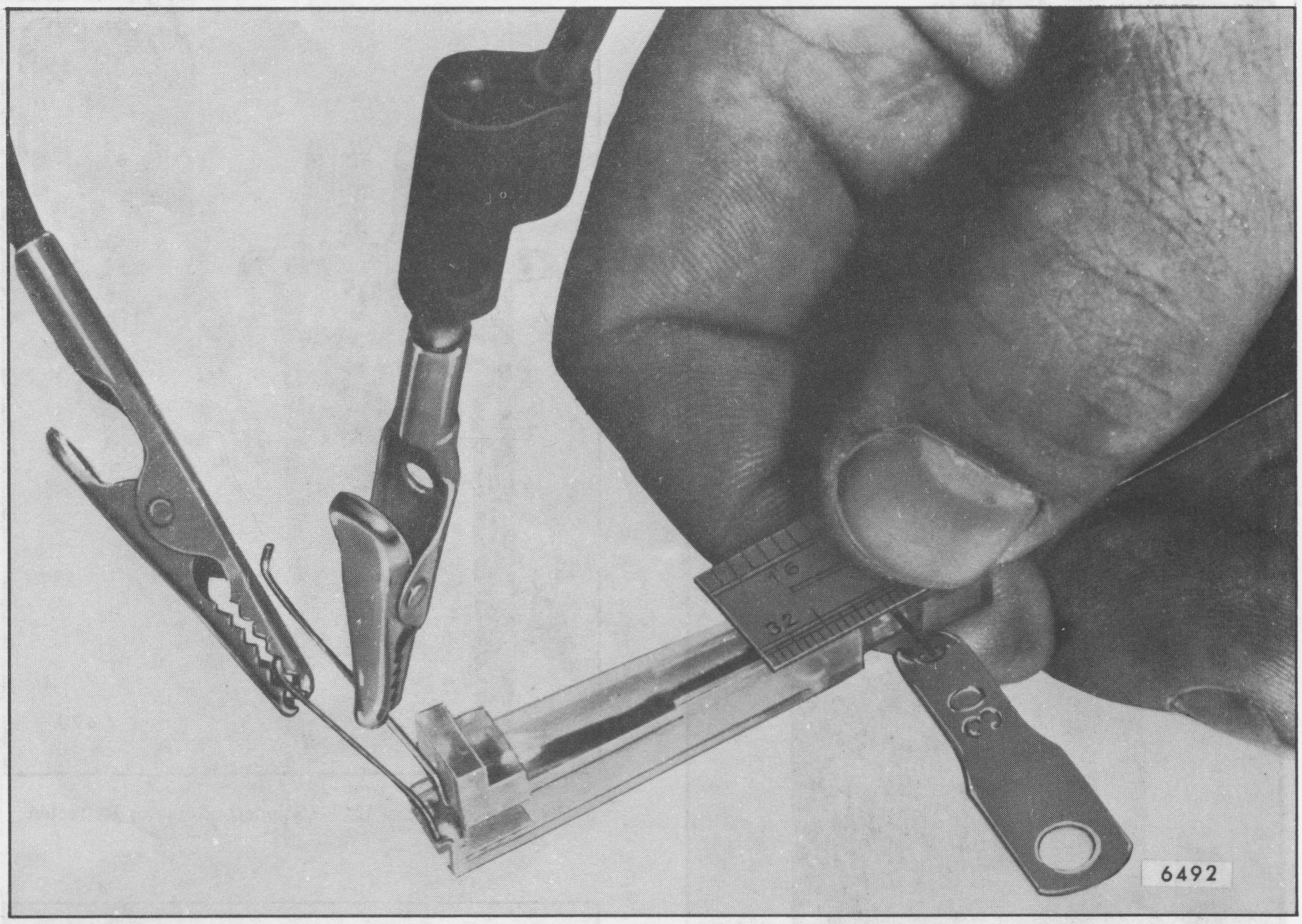

Fig. 5-8-Check Contact Gap

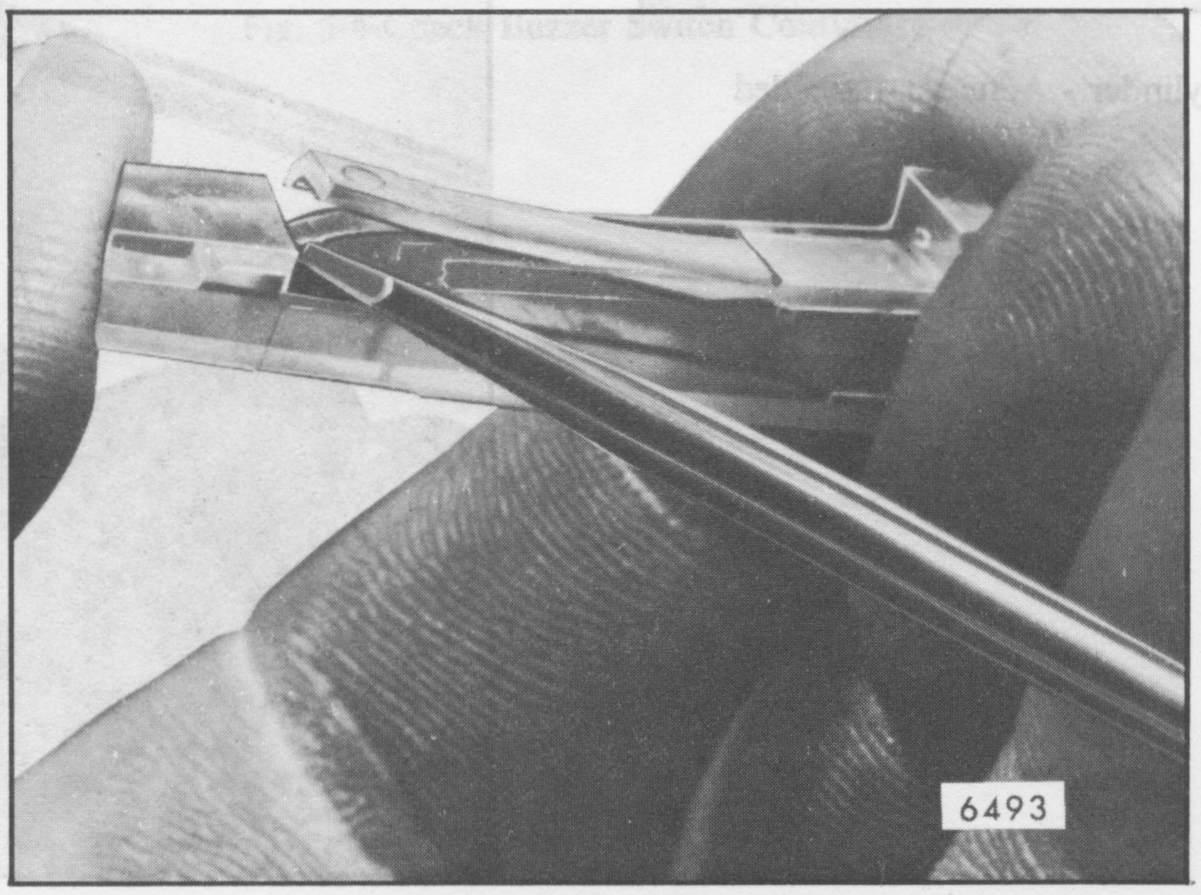

Fig. 5-9-Adjust Buzzer Switch

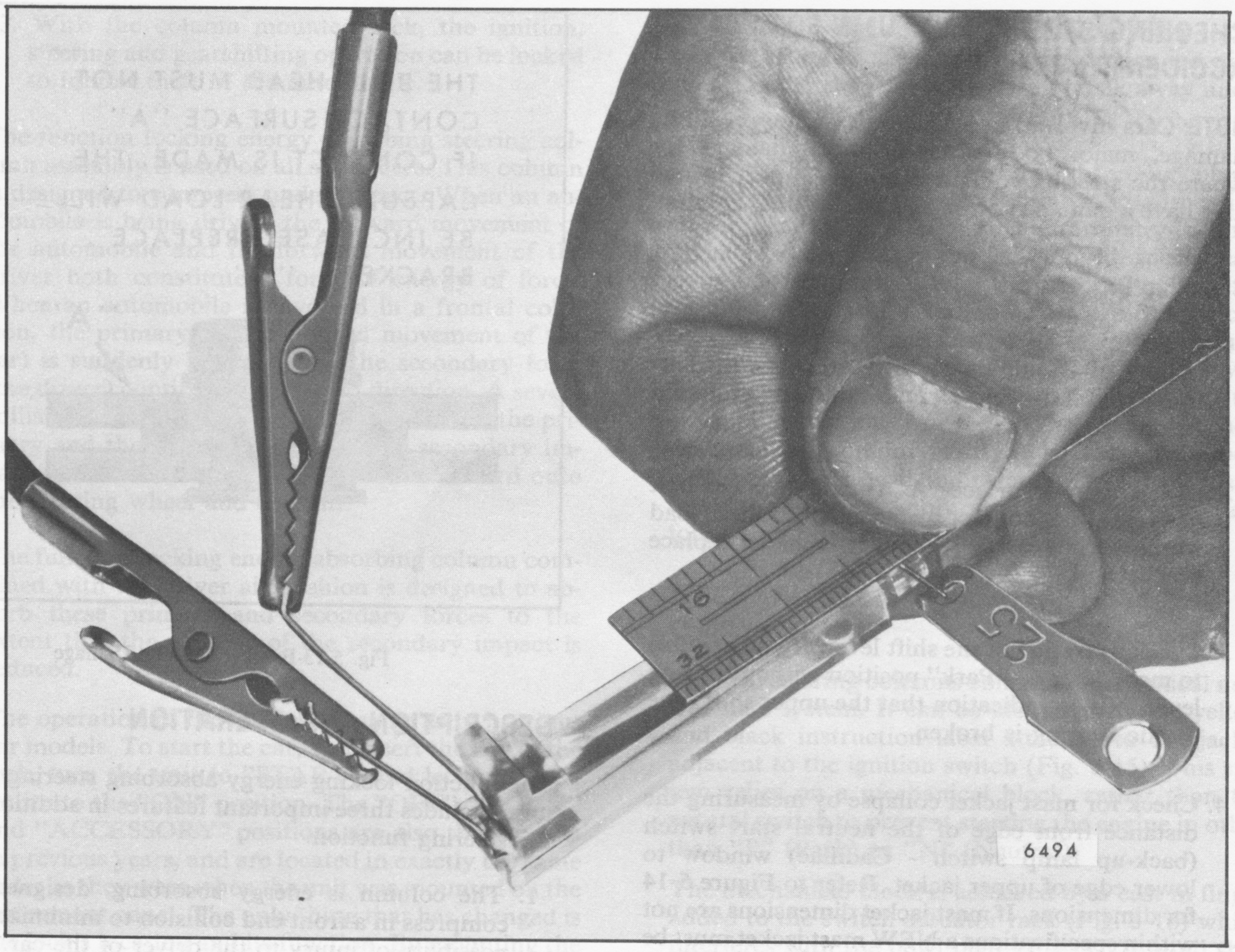

Fig. 5-10-Check Contact Gap

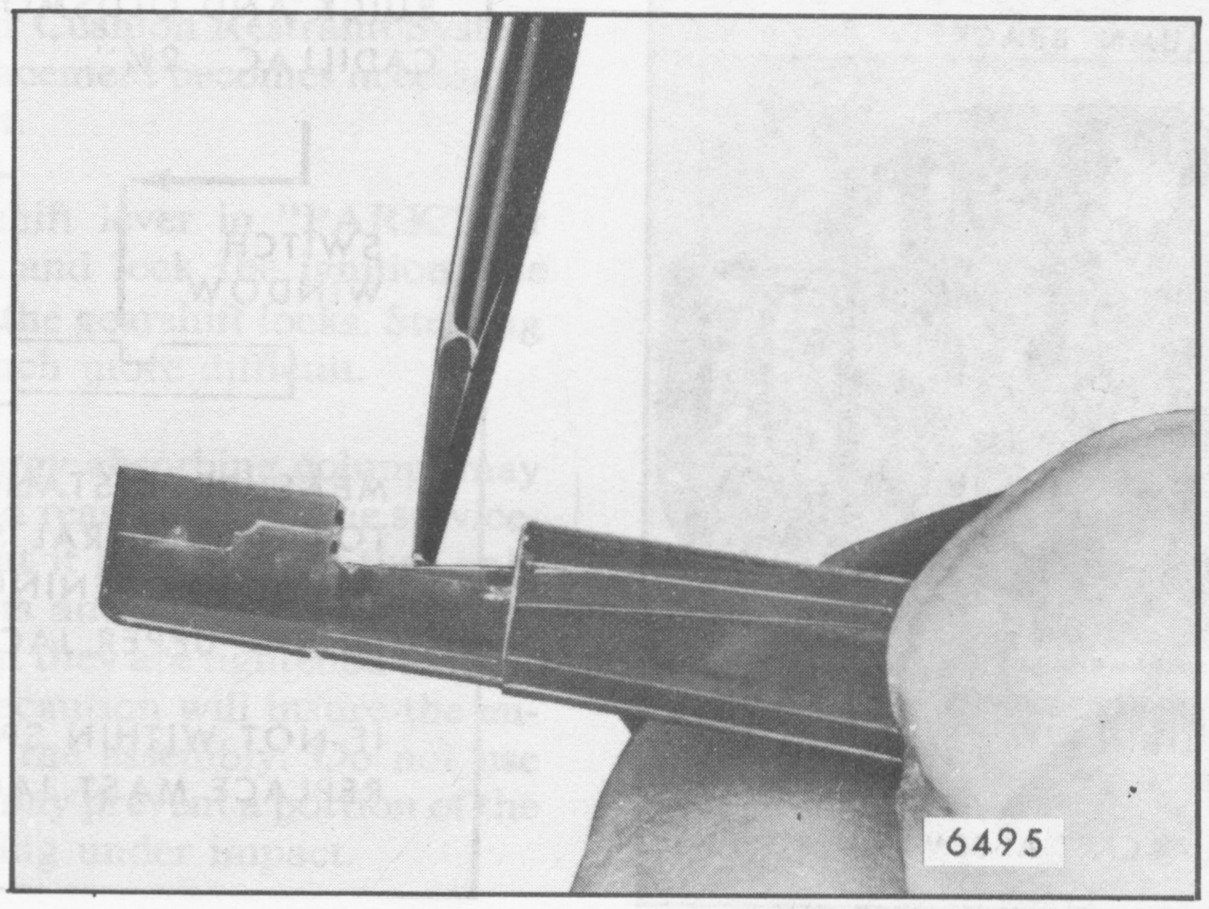

Fig. 5-11-Adjust Buzzer Switch

CHECKING STEERING COLUMN FOR ACCIDENT DAMAGE - All

NOTE: Cars involved in accidents resulting in frame damage, major body or sheet metal damage, or where the steering column has been impacted may also have a damaged or misaligned steering column.

Checking Procedure

1. Check capsules on steering column bracket assembly; all should be within 1/16" from the bottom of the slots (Fig. 5-12). If not, bracket should be replaced.

2. Check contact surface "A" (Fig. 5-13). The bolt head must not contact surface "A" or shear load would be increased. If contact is made, replace bracket.

3. Check operation of the shift lever. If you are able to move lever to "Park" position without raising lever, it is an indication that the upper shift tube plastic bearing is broken.

4. Check for mast jacket collapse by measuring the distance from edge of the neutral start switch (back-up lamp switch - Cadillac) window to lower edge of upper jacket. Refer to Figure 5-14 for dimensions. If mast jacket dimensions are not within specifications a NEW mast jacket must be installed.

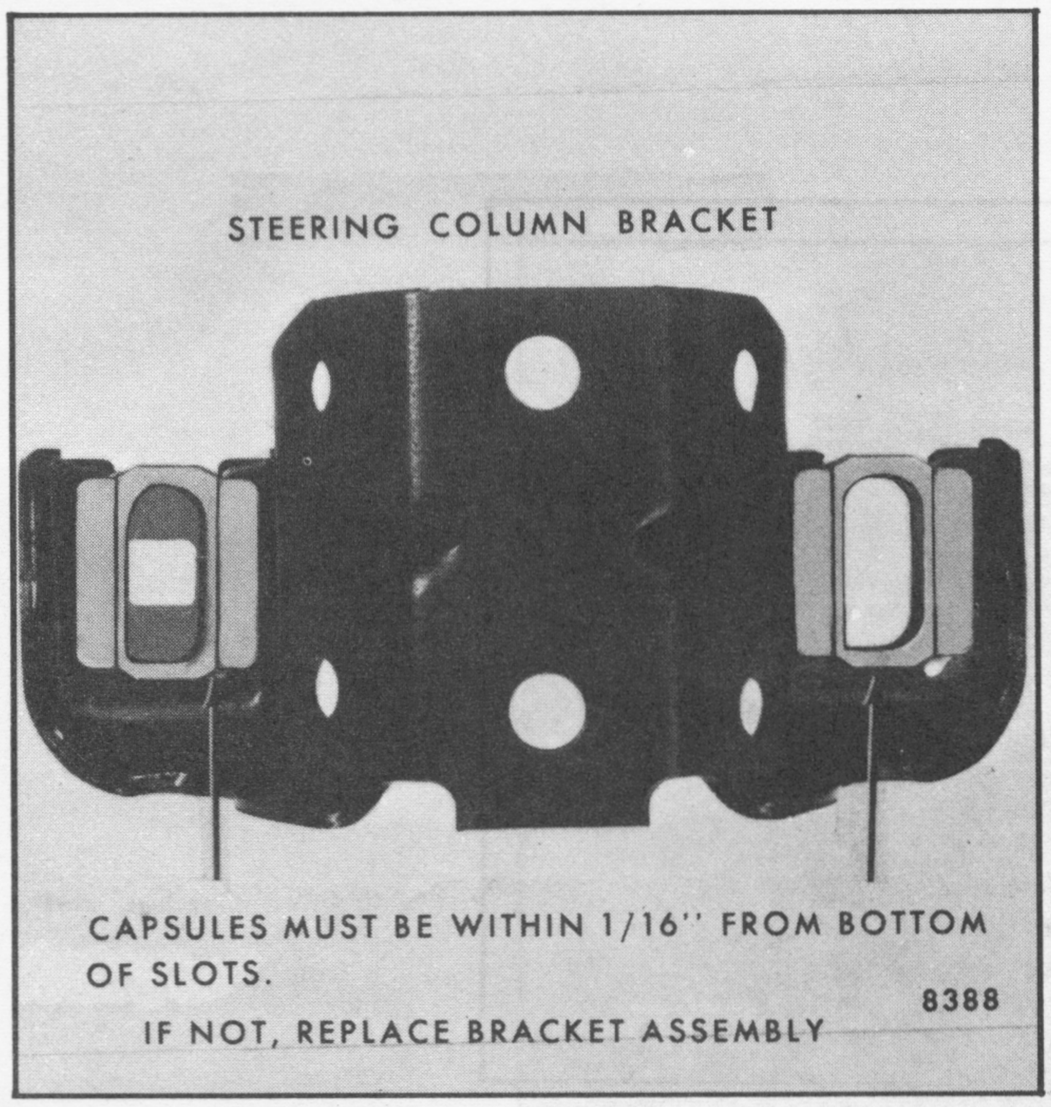

Fig. 5-12-Checking Steering Column Bracket Capsules

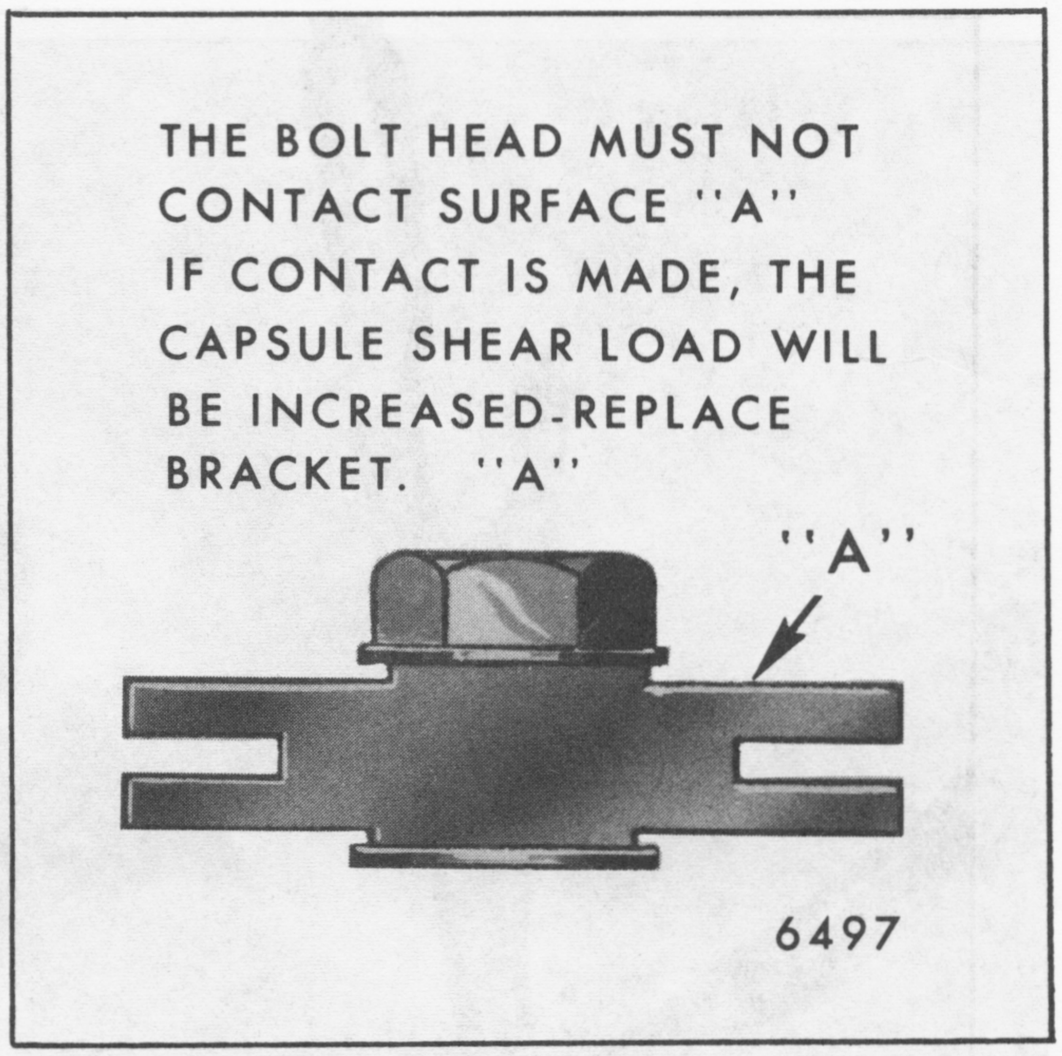
THE BOLT HEAD MUST NOT CONTACT SURFACE "A" IF CONTACT IS MADE, THE CAPSULE SHEAR LOAD WILL BE INCREASED-REPLACE BRACKET.
"A"
"A"
6497

Fig. 5-13-Bracket Capsule Damage

DESCRIPTION AND OPERATION

The function locking energy absorbing steering column includes three important features in addition to the steering function:

1. The column is energy absorbing, designed to compress in a front end collision to minimize the possiblity of injury to the driver of the car.

2. The ignition switch and lock are mounted conventiently on the column.

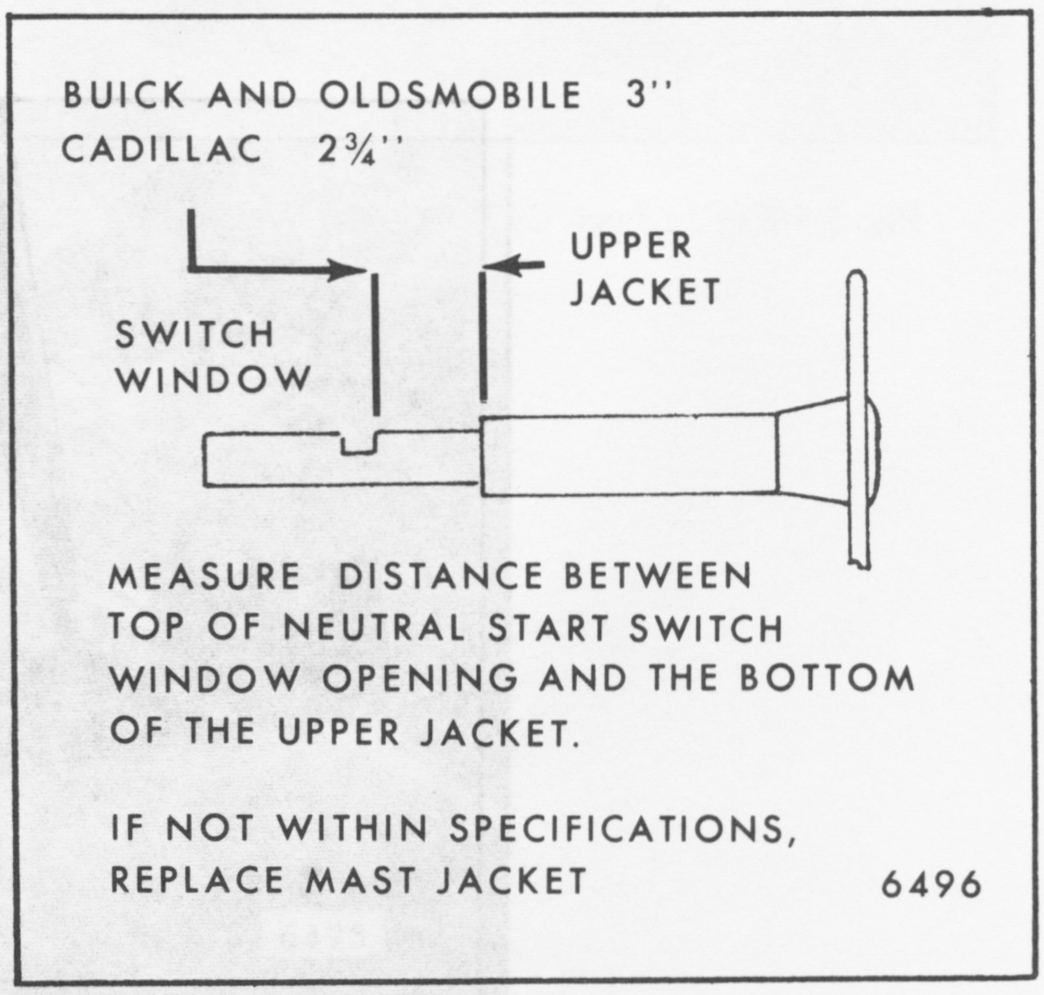
BUICK AND OLDSMOBILE 3"
CADILLAC 2¾"
UPPER JACKET
SWITCH WINDOW
MEASURE DISTANCE BETWEEN TOP OF NEUTRAL START SWITCH WINDOW OPENING AND THE BOTTOM OF THE UPPER JACKET.
IF NOT WITHIN SPECIFICATIONS, REPLACE MAST JACKET
6496

Fig. 5-14-Checking Mast Jacket for Collapse

3. With the column mounted lock, the ignition, steering and gearshifting operation can be locked to inhibit theft of the automobile.

The function locking energy absorbing steering column assembly is used on all series cars. This column is designed to compress under impact. When an automobile is being driven, the forward movement of the automobile and the forward movement of the driver both constitute a form of energy of force. When an automobile is involved in a frontal collision, the primary force (forward movement of the car) is suddenly halted, while the secondary force (the driver) continues its forward direction. A severe collision generally involves these two forces, the primary and the secondary forces. The secondary impact occurs when the driver is thrust forward onto the steering wheel and column.

The function locking energy absorbing column combined with the driver air cushion is designed to absorb these primary and secondary forces to the extent that the severity of the secondary impact is reduced.

The operation of the lock is the same as in previous car models. To start the car, you insert the key in the lock, turn the unit to "START" and let the switch return to the "ON" position. The "OFF", "LOCK" and "ACCESSORY" positions are also the same as in previous years, and are located in exactly the same order as they were when the unit was mounted on the instrument panel. The only thing that has changed is the lock's location and its function. By mounting the ignition lock on the column, two new features are possible.

The air cushion column contains a specific ignition switch with a terminal accessory No. 2 which is excited in all positions of the switch except "LOCK". The terminal feeds all Air Cushion Restraint System and signal circuit. If replacement becomes necessary, replace with correct part.

When you engage the shift lever in "PARK" for automatic transmissions and lock the ignition, the steering wheel locks and the gearshift locks. Stealing the car now becomes much more difficult.

The function locking energy absorbing column may be easily disassembled and reassembled. The serviceman should be aware that it is important that only the specified screws, bolts and nuts be used as designed designated and that they are tightened to their specified torque. This precaution will insure the energy absorbing action of the assembly. Do not use overlength bolts, as they may prevent a portion of the assembly from compressing under impact.

Equally as important is correct torque of bolts and nuts. Care should be taken to assure that the bolts or nuts securing the column mounting bracket to the instrument panel are torqued to the proper specification in order that the bracket will break away under impact.

When the function locking energy absorbing column assembly is installed in a car, it is no more susceptible to damage through usage than an ordinary column, however, when the column is removed, special care must be taken in handling this assembly. Only the specified wheel puller should be used. When the column is removed from the car, such action as a sharp blow on the end of the steering shaft or shift lever, leaning on the column assembly, or dropping of the assembly could shear or loosen the plastic fasteners that maintain column rigidity. It is, therefore, important that the removal and installation and the disassembly and reassembly procedures be carefully followed when servicing the assembly.

MECHANICAL NEUTRAL START SYSTEM - Cadillac

Cadillac steering columns contain a mechanical neutral start system. It can be identified by the yellow and black instruction label attached to the jacket adjacent to the ignition switch (Fig. 5-15). This system relies on a mechanical block, rather than the netural switch to prevent starting the engine in other than "P" (Park) or "N" (Neutral).

The mechanical block is achieved by a cast in finger added to the switch actuator rack (Fig. 5-16) which interferes with the bowl plate (Fig. 5-17) in all shift positions except "N" (Neutral) or "P" (Park). This interference prevents rotation of the lock cylinder into the "START" position.

In either "P" or "N", this finger passes through the bowl plate (Figs. 5-18 and 5-19) slots, allowing the

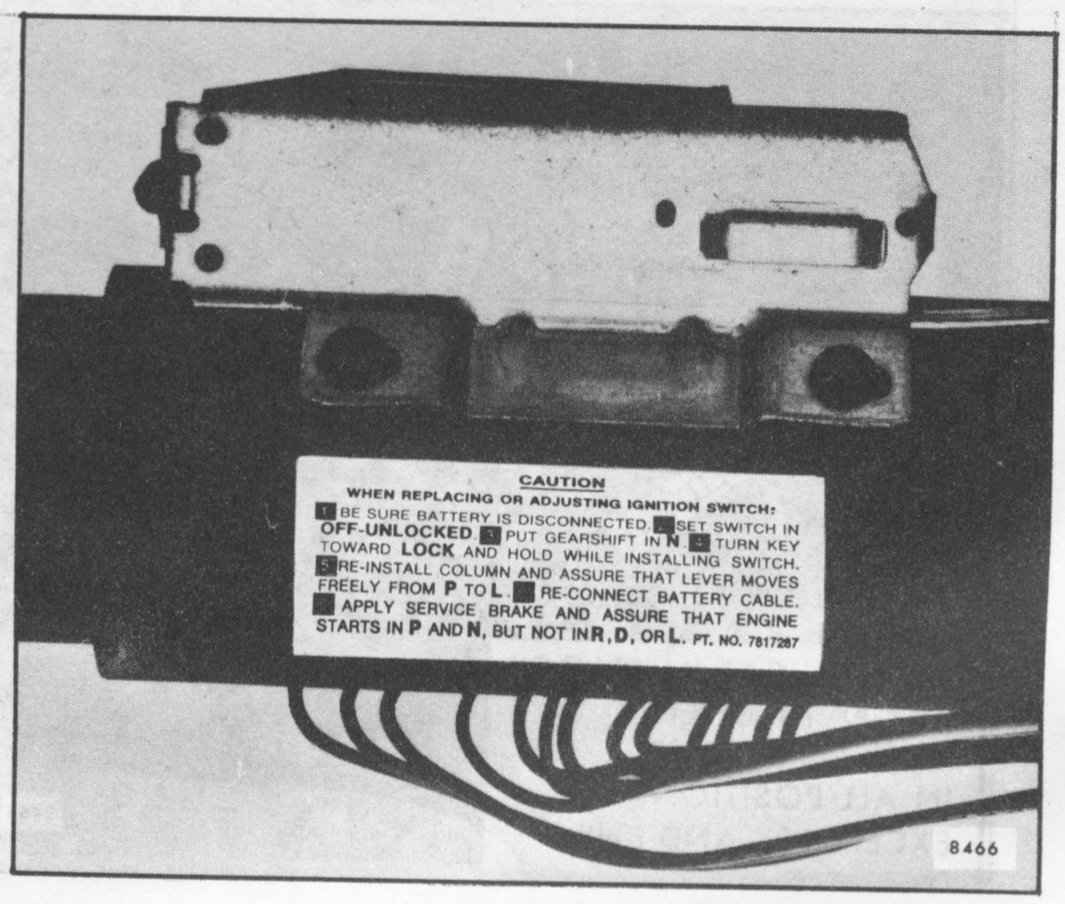
CAUTION
WHEN REPLACING OR ADJUSTING IGNITION SWITCH:
1 BE SURE BATTERY IS DISCONNECTED. 2 SET SWITCH IN OFF-UNLOCKED 3 PUT GEARSHIFT IN N. 4 TURN KEY TOWARD LOCK AND HOLD WHILE INSTALLING SWITCH. 5 RE-INSTALL COLUMN AND ASSURE THAT LEVER MOVES FREELY FROM P TO L. 6 RE-CONNECT BATTERY CABLE. 7 APPLY SERVICE BRAKE AND ASSURE THAT ENGINE STARTS IN P AND N, BUT NOT IN R, D, OR L. PT. NO. 7817287
8466

Fig. 5-15-Instruction Label

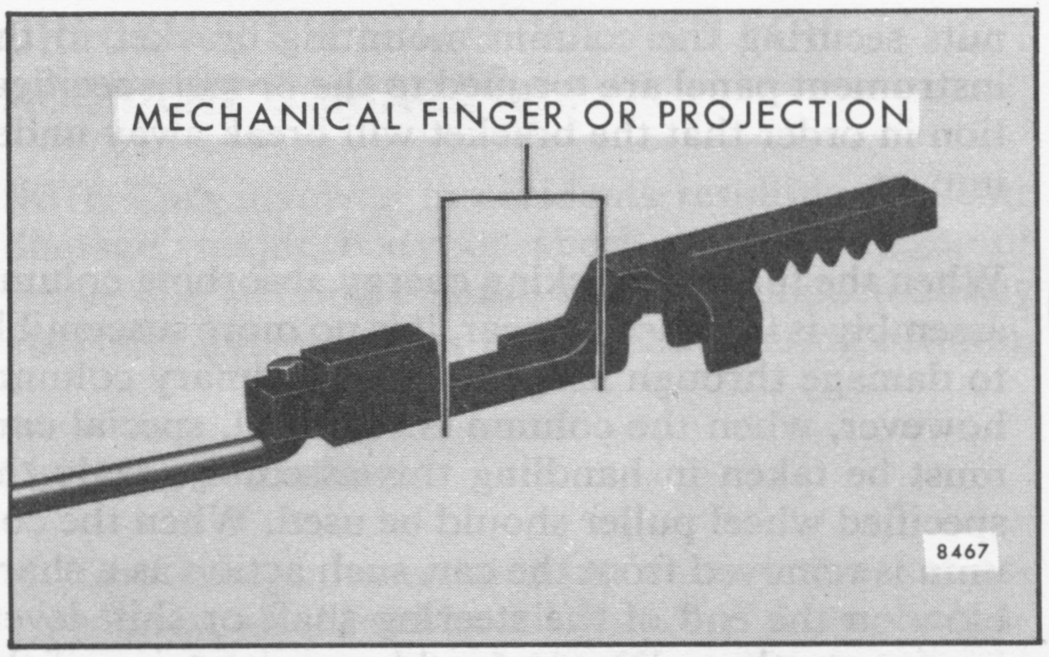

Fig. 5-16-Actuator Rack

lock cylinder full rotational travel into the "Start" position.

Servicing procedures remain the same as does assembly and disassembly. Some parts have been changed dimensionally and are identified as follows:

1. Mechanical neutral start system column is identified by yellow instruction tag adjacent to the ignition switch (Fig. 5-15).
2. The switch actuator rack has the projection or cast in finger and is dyed black.
3. The shift bowl park and neutral slots are more precise in size and location.

CAUTION: *Do not substitute "old" style parts in service as this could defeat the mechanical neutral start system.*

When replacing or adjusting ignition switch:

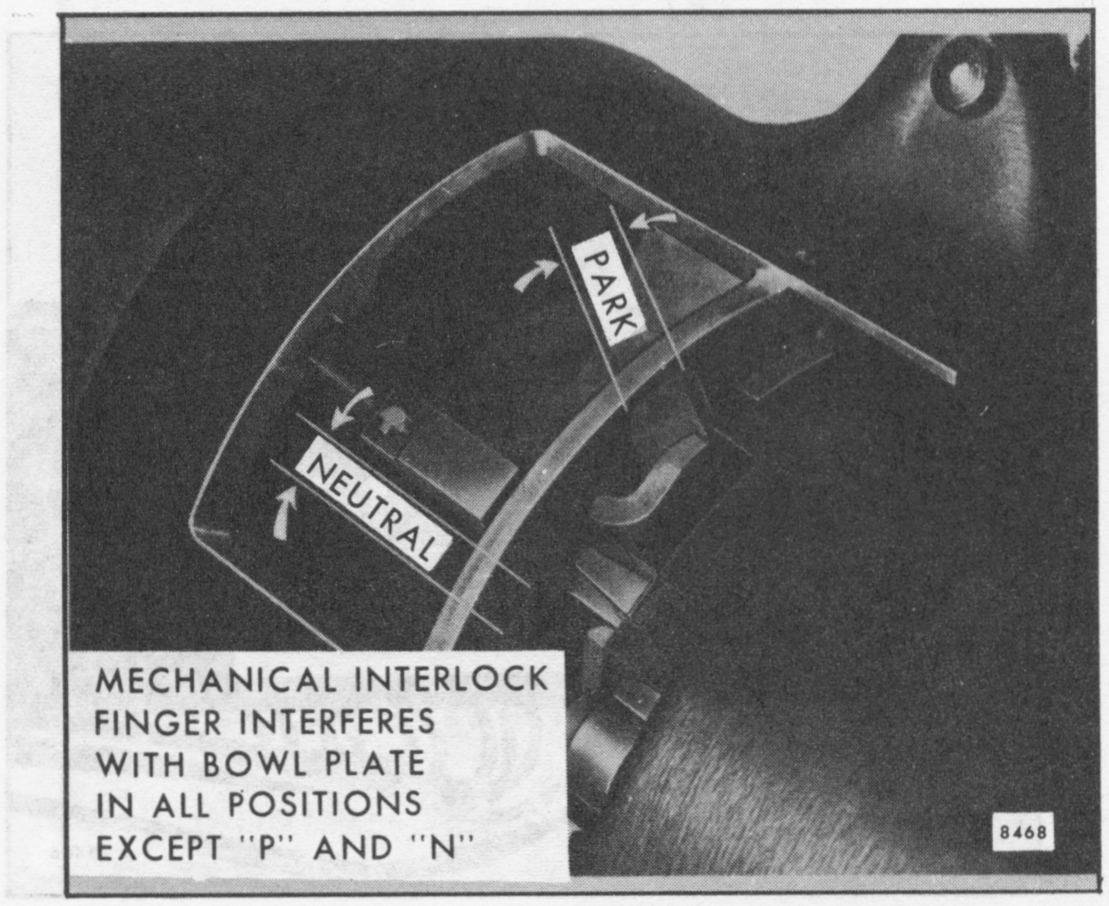

Fig. 5-17-Bowl Plate

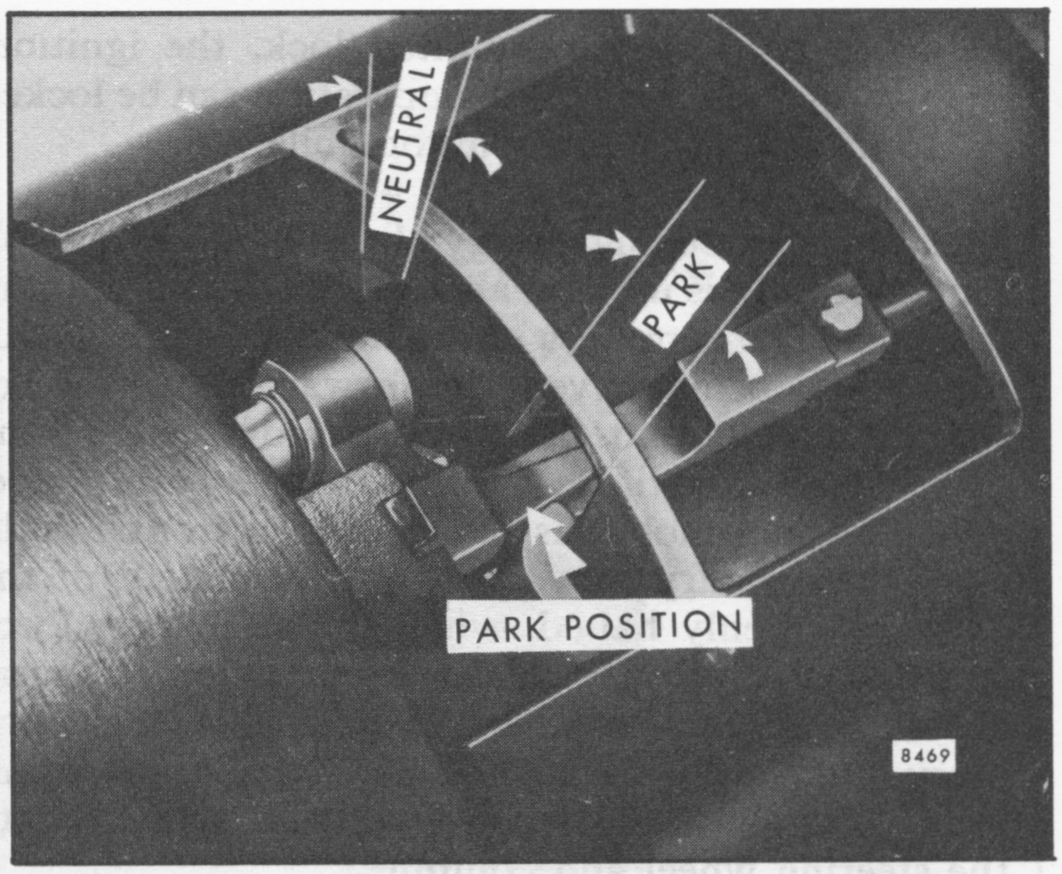

Fig. 5-18-Bowl Plate - Park Slot

1. Be sure battery is disconnect and cable end is taped.
2. Set switch in "OFF-UNLOCKED".
3. Put gearshift in "N".
4. Turn key toward "LOCK" and hold while installing switch.
5. Reinstall column and assure that lever moves freely from "P" to "L".
6. Reconnect battery cable.
7. Apply service brake and assure that engine starts in "P" and "N", but not in "R", "D" or "L".

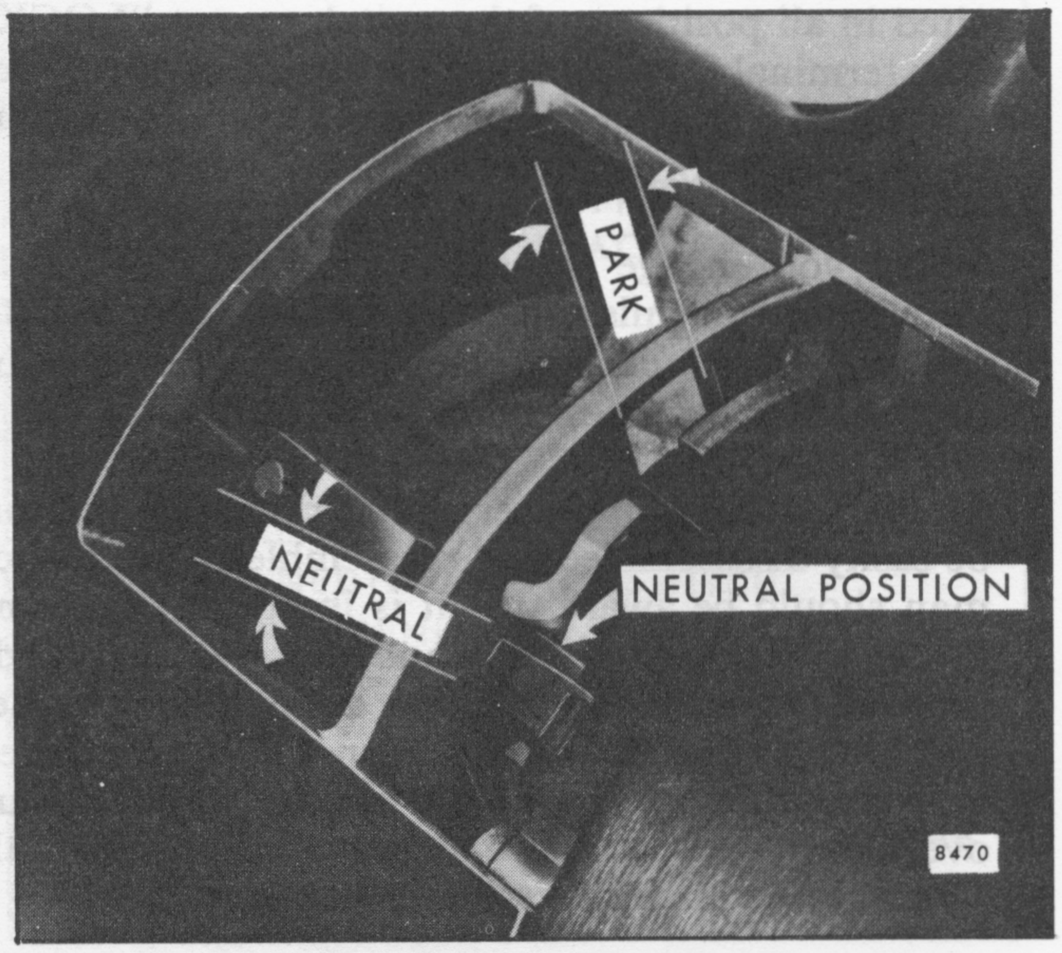

Fig. 5-19-Bowl Plate - Neutral Slot

If either the ignition switch or column jacket is replaced, any "witness" marks on the switch bracket must be removed by flattening and the ignition swich adjusted per the above procedure.

CAUTION: *Always check the start system as directed on the instruction label before releasing the vehicle.*

STEERING COLUMN - Buick and Oldsmobile

Removal

NOTE: Once the steering column is removed from the car, the column is extremely susceptible to damage. Dropping the column assembly on its end could collapse the steering shaft or loosen the plastic injections which maintain column rigidity. Leaning on the column assembly could cause the jacket to bend or deform. Any of the above damage could impair the column's collapsible design. If it is necessary to remove the steering wheel, use standard wheel puller. Under no conditions should the end of the shaft be hammered upon as hammering could loosen plastic injection which maintain column rigidity.

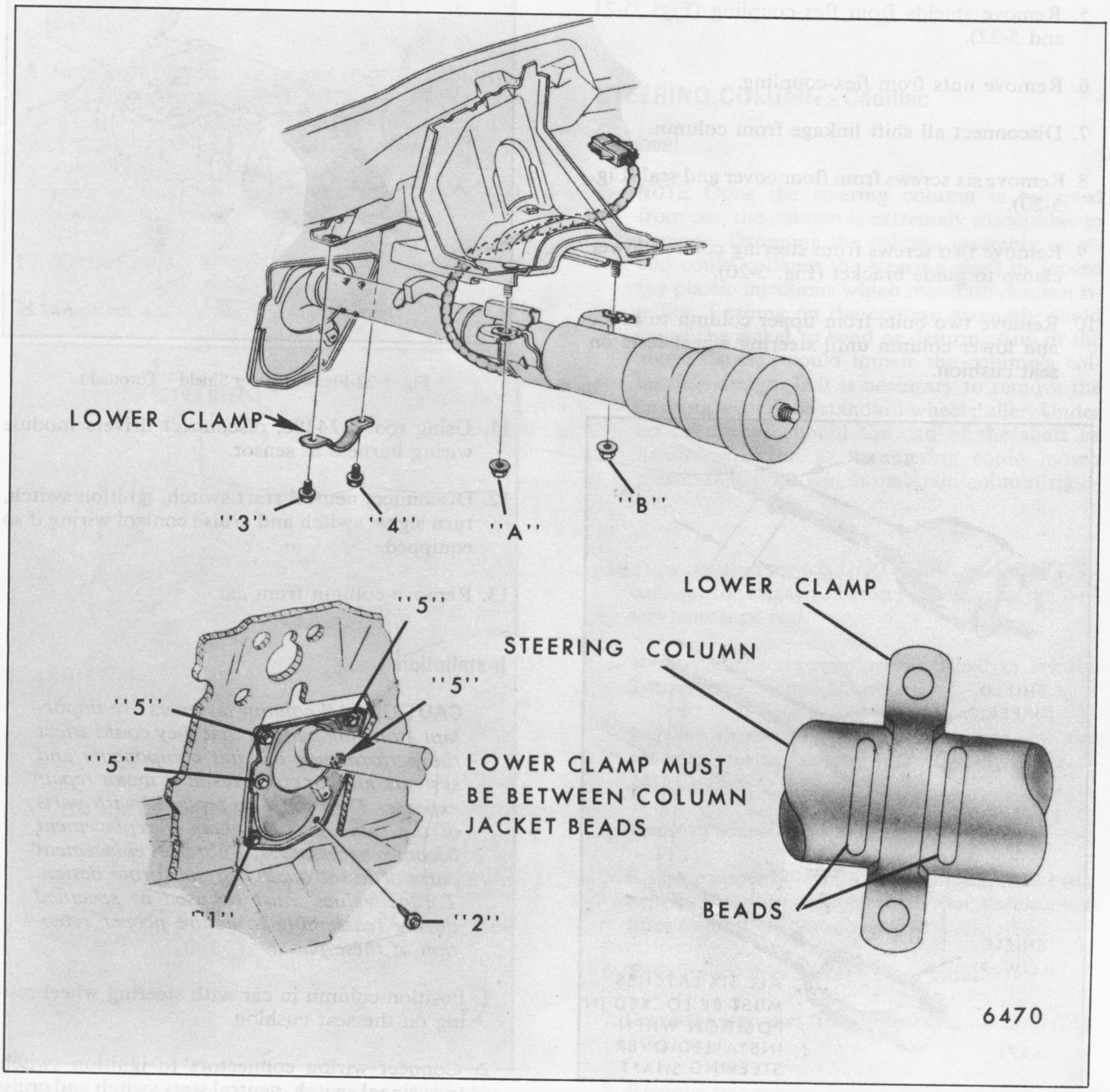

Fig. 5-20-Steering Column Attachment - Buick and Oldsmobile

1. Turn ignition switch to "LOCK" position. Disconnect the negative battery cable from the battery and tape end.

2. Remove knee restraint as described in Section 2-Instrument Panel Components.

3. Remove four screws attaching knee restraint brace to steering column guide bracket.

4. Remove screw from shift indicator needle and remove needle.

5. Remove shields from flex-coupling (Figs. 5-21 and 5-22).

6. Remove nuts from flex-coupling.

7. Disconnect all shift linkage from column.

8. Remove six screws from floor cover and seal (Fig. 5-20).

9. Remove two screws from steering column lower clamp to guide bracket (Fig. 5-20).

10. Remove two bolts from upper column to brace and lower column until steering wheel rests on seat cushion.

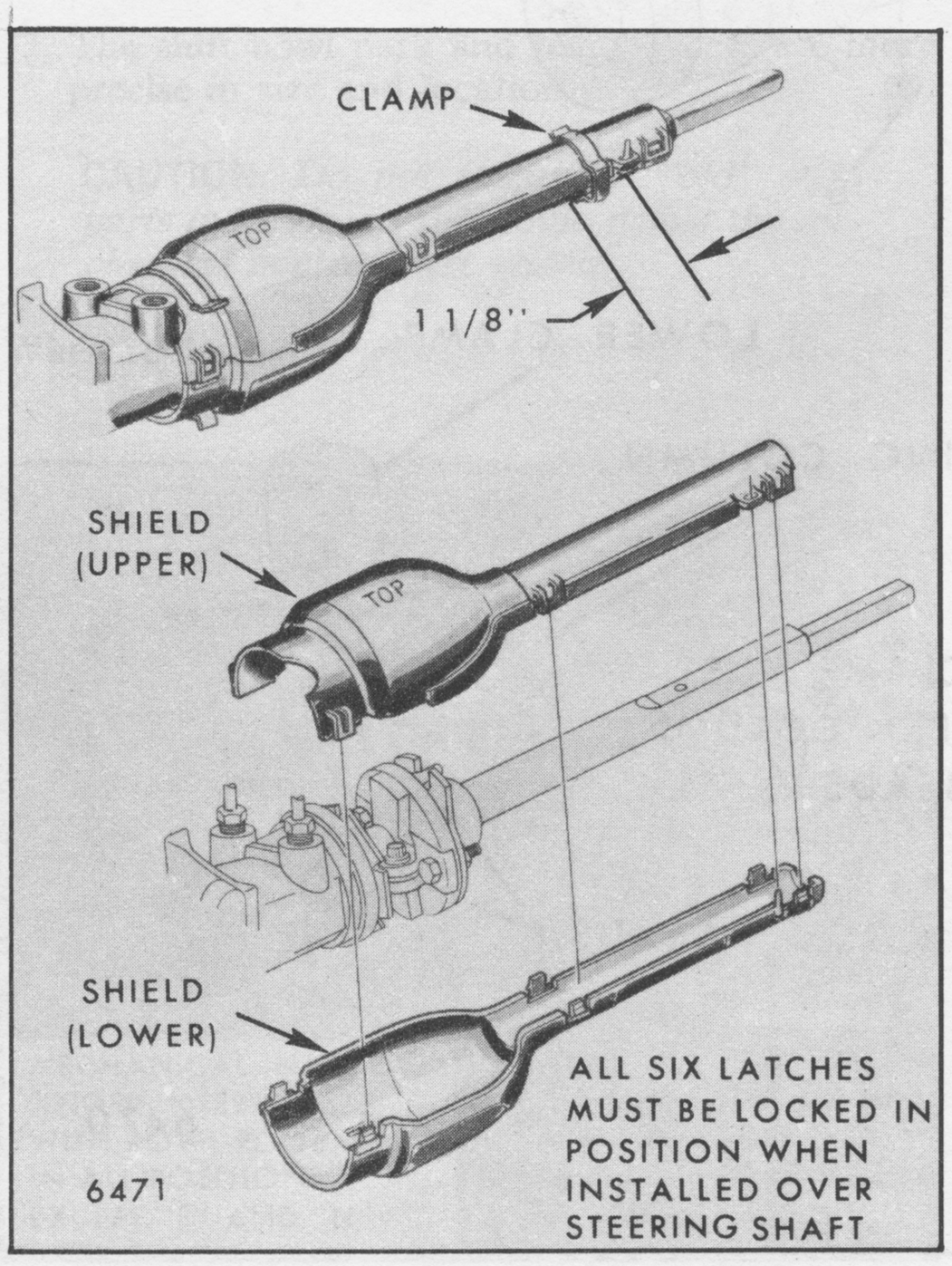

Fig. 5-21-Flex-Coupling Shield - Buick and Oldsmobile

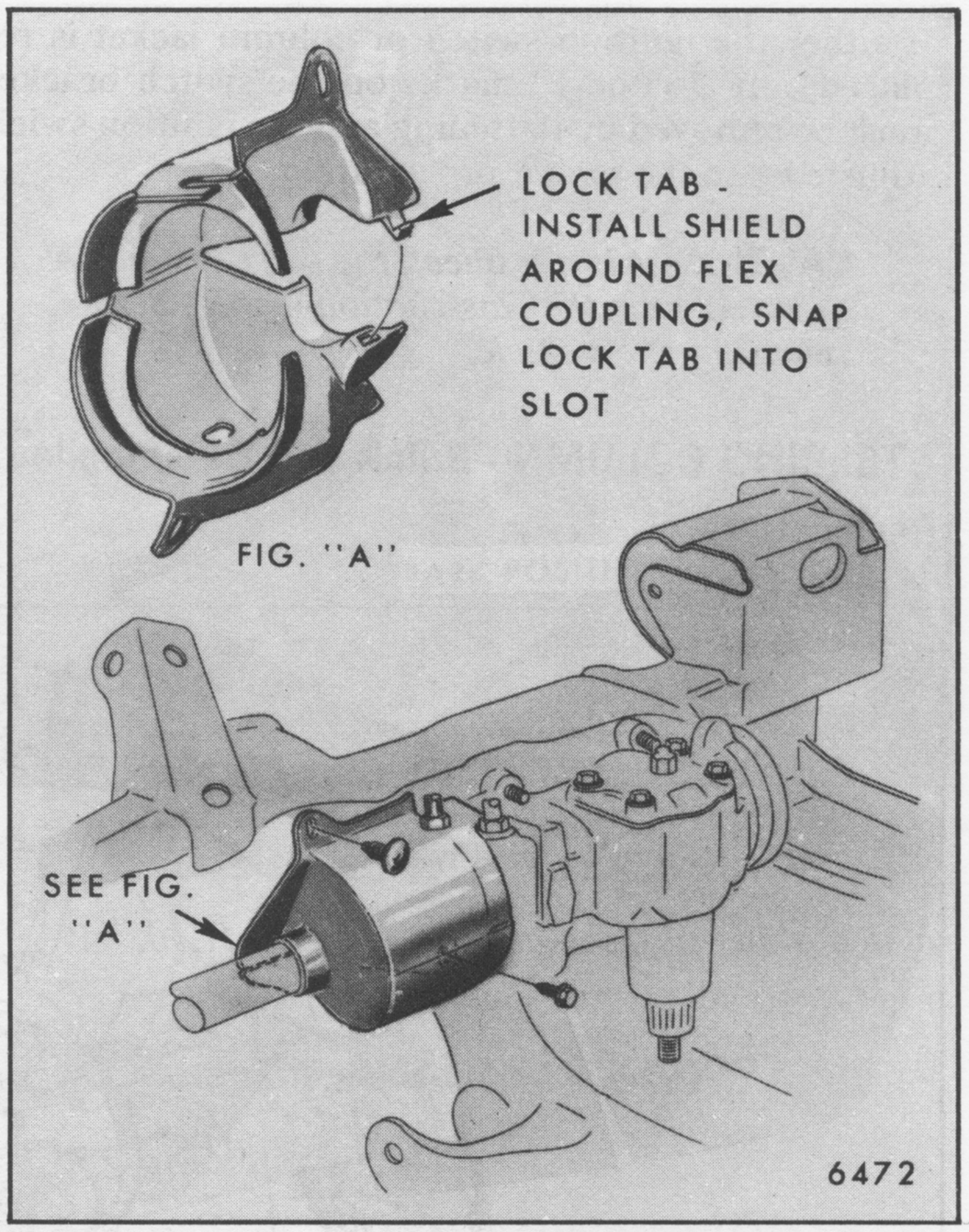

Fig. 5-22-Flex-Coupling Shield - Toronado

11. Using tool J-24388, disconnect drivers module wiring harness at sensor.

12. Disconnect neutral start switch, ignition switch, turn signal switch and cruise control wiring if so equipped.

13. Remove column from car.

Installation

CAUTION: *All column fasteners are important attaching parts in that they could affect the performance of vital components and systems, and/or could result in major repair expense. They must be replaced with parts of the same part numbers if replacement becomes necessary. Do not use replacement parts of lesser quality or substitute design. Torque values must be used as specified during reassembly to assure proper retention of these parts.*

1. Position column in car with steering wheel resting on the seat cushion.

2. Connect wiring connectors to ignition switch, turn signal switch, neutral start switch and cruise control if so equipped.

3. Position flex-coupling flange to flex-coupling, install nuts and lock washers, torque to 20 foot pounds.

4. Raise column into position and loosely install nuts "A" and "B" (Fig. 5-20).

5. Position floor cover and seal, then install screw (No. 1) loosely (Fig. 5-20).

6. Install screw (No. 2) and torque to 3 foot pounds (Fig. 5-20).

7. Torque screw (No. 1) to to 3 foot pounds (Fig. 5-20).

8. Install four remaining screws (No. 5) and torque to 3 foot pounds (Fig. 5-20).

9. Loosely install two screws to lower clamp to guide bracket. Torque screw (No. 4) to 3 foot pounds, then torque screw (No. 3) to 3 foot pounds (Fig. 5-20).

10. Torque nuts "A" and "B" to 20 foot pounds.

11. Connect shift linkage to shift lever.

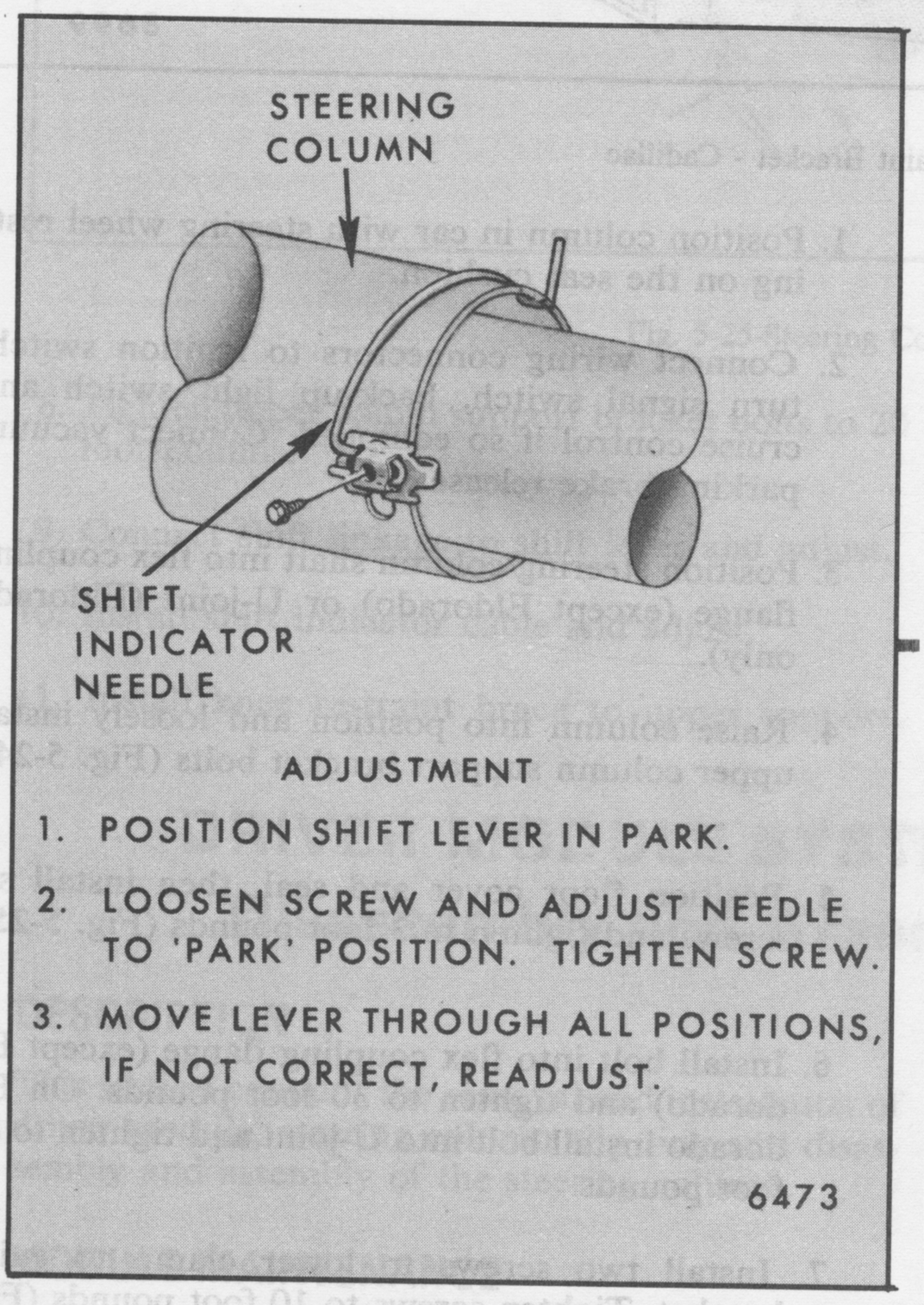
STEERING COLUMN
SHIFT INDICATOR NEEDLE
ADJUSTMENT
1. POSITION SHIFT LEVER IN PARK.
2. LOOSEN SCREW AND ADJUST NEEDLE TO 'PARK' POSITION. TIGHTEN SCREW.
3. MOVE LEVER THROUGH ALL POSITIONS, IF NOT CORRECT, READJUST.
6473

Fig. 5-23-Shift Indicator Needle Adjustment - Oldsmobile Shown

12. Install shields to flex-coupling (Figs. 5-21 and 5-22).

13. Install knee restraint brace to guide bracket.

14. Install shift indicator needle and adjust (Fig. 5-23).

15. Install knee restraint as described in Section 2-Instrument Panel Components.

16. Remove tape from negative battery cable, connect cable to battery and torque to 90 inch pounds.

STEERING COLUMN - Cadillac

Removal

NOTE: Once the steering column is removed from car, the column is extremely susceptible to damage. Dropping the column assembly on its end could collapse the steering shaft or loosen the plastic injections which maintain column rigidity. Leaning on the column assembly could cause the jacket to bend or deform. Any of the above damage could impair the column's collapsible design. If it is necessary to remove the steering wheel, use standard wheel puller. Under no conditions should the end of the shaft be hammered upon as hammering could loosen plastic injections which maintain column rigidity.

1. Turn ignition switch to "LOCK" position. Disconnect the negative battery cable from the battery and tape end.

2. Remove knee restraint as described in Section 2-Instrument Panel Components.

3. Remove three fasteners attaching knee restraint brace to steering column guide bracket (Fig. 5-24).

4. Remove screw from shift indicator cable.

5. Remove upper bolt from flex-coupling flange (except Eldorado) or upper bolt from steering column U-joint (Eldorado only).

6. Disconnect shift linkage from column.

7. Remove six screws from floor cover and seal (Fig. 5-25).

8. Remove two screws from steering column lower clamp to guide bracket (Fig. 5-25).

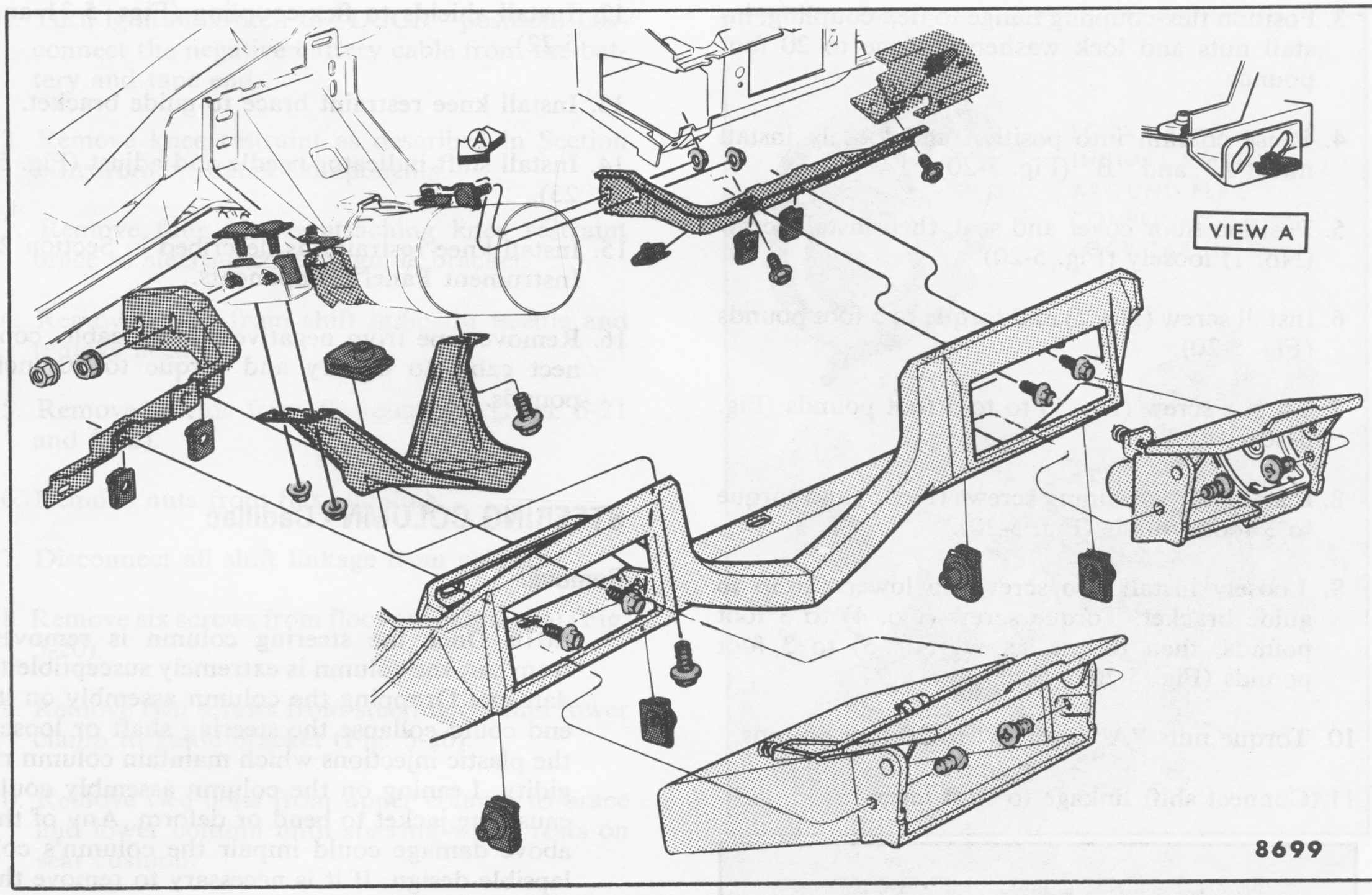

Fig. 5-24-Knee Restraint Bracket - Cadillac

9. Remove two bolts from upper column to brace and lower column until steering wheel rests on seat cushion.

10. Using tool J-24388 disconnect drivers module wiring harness at sensor.

11. Disconnect connectors to the back-up switch, ignition switch, turn signal switch, vacuum parking brake release and cruise control wiring if so equipped.

12. Remove column from car.

Installation

CAUTION: *All column fasteners are important attaching parts in that they could affect the performance of vital components and systems, and/or could result in major repair expense. They must be replaced with parts of the same part numbers if replacement becomes necessary. Do not use replacement parts of lesser quality or substitute design. Torque values must be used as specified during reassembly to assure proper retention of these parts.*

1. Position column in car with steering wheel resting on the seat cushion.

2. Connect wiring connectors to ignition switch, turn signal switch, back-up light switch and cruise control if so equipped. Connect vacuum parking brake release.

3. Position steering column shaft into flex coupling flange (except Eldorado) or U-joint (Eldorado only).

4. Raise column into position and loosely install upper column support bracket bolts (Fig. 5-24).

5. Position floor cover and seal, then install six screws and tighten to 3 foot pounds (Fig. 5-25).

6. Install bolt into flex coupling flange (except Eldorado) and tighten to 30 foot pounds. On Eldorado install bolt into U-joint and tighten to 80 foot pounds.

7. Install two screws to lower clamp to guide bracket. Tighten screws to 10 foot pounds (Fig. 5-25).

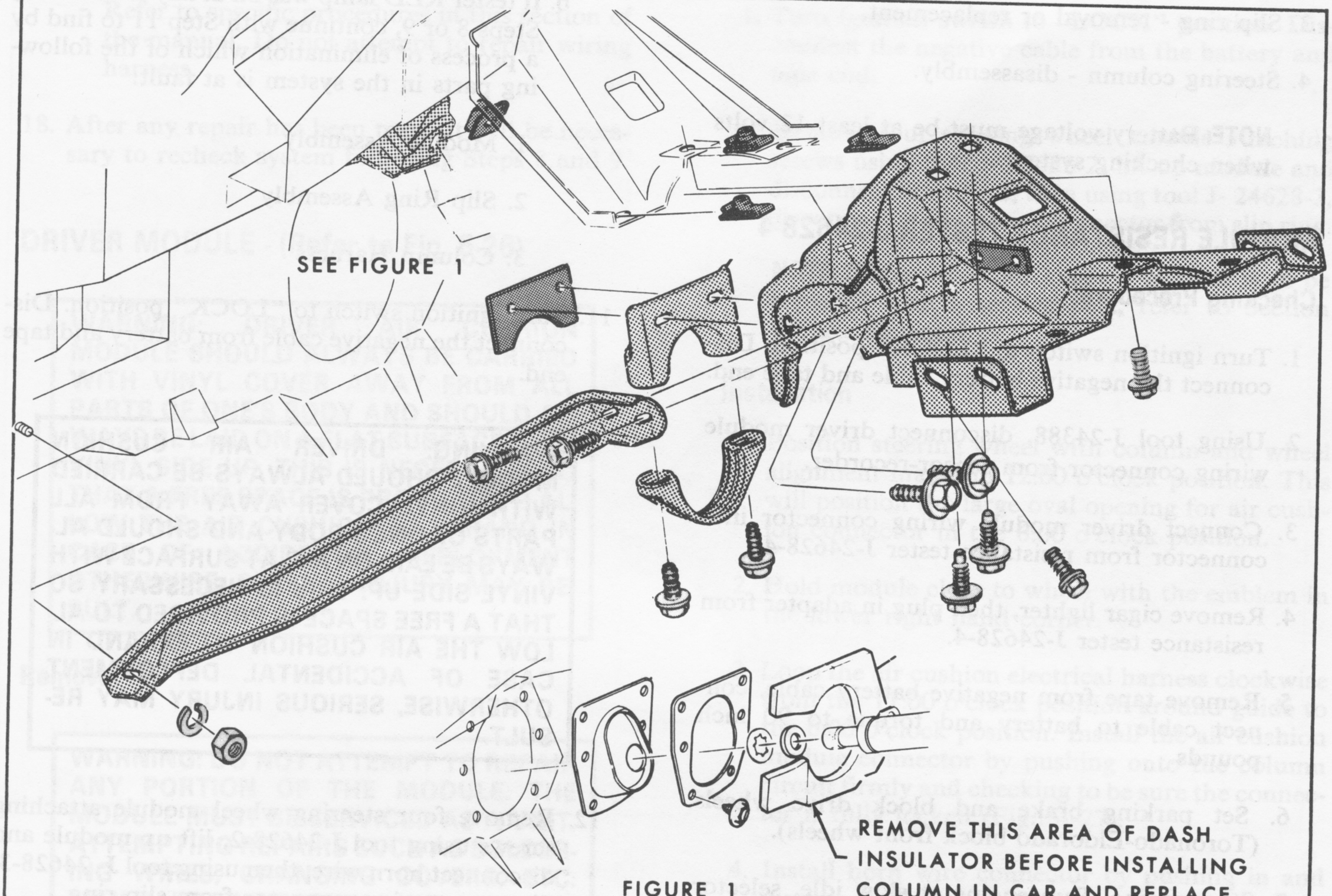
SEE FIGURE 1
REMOVE THIS AREA OF DASH INSULATOR BEFORE INSTALLING COLUMN IN CAR AND REPLACE AFTER COLUMN IS SET
FIGURE 1
8700

Fig. 5-25-Steering Column Attachment - Cadillac

8. Tighten upper colum support bracket bolts to 20 foot pounds.

9. Connect shift linkage to shift lever and adjust.

10. Install shift indicator cable and adjust.

11. Install knee restraint brace to upper support. Tighten nuts to 15 foot pounds and bolt to 20 foot pounds.

12. Install knee restraint as described in Section 2-Instrument Panel Components.

13. Remove tape from negative battery cable, connect cable to battery and torque to 90 inch pounds.

DRIVER MODULE SYSTEM (Includes Slip Ring and Disassembly and Assembly of Steering Column)

DESCRIPTION

This section contains the removal and installation of driver module, steering column slip ring and disassembly and assembly of the steering column.

MODULE MAINTENANCE

No periodic maintenance is required.

CHECKING MODULE

Checking the driver module system with resistance tester J-24628-4 is required after any of the following operations:

1. Driver module - removal or replacement.

2. Steering wheel - removal.

3. Slip ring - removal or replacement.

4. Steering column - disassembly.

NOTE: Battery voltage must be at least 12 volts when checking system.

MODULE RESISTANCE TESTER J-24628-4

Checking Procedure

1. Turn ignition switch to "LOCK" position. Disconnect the negative battery cable and tape end.

2. Using tool J-24388, disconnect driver module wiring connector from sensor-recorder.

3. Connect driver module wiring connector into connector from resistance tester J-24628-4.

4. Remove cigar lighter, then plug in adapter from resistance tester J-24628-4.

5. Remove tape from negative battery cable, connect cable to battery and torque to 90 inch pounds.

6. Set parking brake and block drive wheels (Toronado-Eldorado block front wheels).

7. Start engine. Run engine at slow idle, selector lever in "PARK". Push indicator lamp check button on tester to verify both red and green lamps are good.

8. With toggle switch in position (1), push TEST button. Observe RED or GREEN lamps. Continue to push TEST button while turning steering wheel slowly from stop to stop. Observe any change in lighted lamp, GREEN to RED or RED to GREEN.

9. Repeat Step 8 with toggle switch in position (2).

10. Perform the following:

    a. If tester GREEN lamp was ON at all times during Steps 8 and 9, driver inflator module system is good. Stop engine, turn ignition switch to "LOCK" position. Disconnect negative cable from battery and tape end. Remove adapter from cigar lighter. Using tool J-24388 disconnect resistance tester connector from driver inflator wiring connector. Connect driver inflator wiring connector into position on sensor-recorder. Remove tape from negative battery cable, connect cable to battery and torque to 90 inch pounds. Remove blocks from wheels and release parking brake.

    b. If tester RED lamp was on at any time during Steps 8 or 9, continue with Step 11 to find by a process of elimination which of the following parts in the system is at fault:

        1. Module Assembly

        2. Slip Ring Assembly

        3. Column Harness

11. Turn ignition switch to "LOCK" position. Disconnect the negative cable from battery and tape end.

WARNING: DRIVER AIR CUSHION MODULE SHOULD ALWAYS BE CARRIED WITH VINYL COVER AWAY FROM ALL PARTS OF ONE'S BODY AND SHOULD ALWAYS BE LAID ON A FLAT SURFACE WITH VINYL SIDE UP. THIS IS NECESSARY SO THAT A FREE SPACE IS PROVIDED TO ALLOW THE AIR CUSHION TO EXPAND IN CASE OF ACCIDENTAL DEPLOYMENT OTHERWISE, SERIOUS INJURY MAY RESULT.

12. Remove four steering wheel module attaching screws using tool J-24628-2, lift up module and disconnect horn wire, then using tool J- 24628-3, disconnect wire connector from slip ring.

13. Install driver inflator substitute load J-24628-5 into slip ring connector.

14. Remove tape from negative battery cable, connect cable to battery and torque to 90 inch pounds.

15. Start engine. Run engine at slow idle, selector lever in "PARK".

16. Repeat Steps 8 and 9.

17. Perform the following:

    a. If tester GREEN lamp is now ON at all times during Steps 8 and 9, the driver module is faulty and will require module assembly replacement. Refer to Air Cushion Restraint System Service Manual, Section 5 for procedures.

    b. If tester RED lamp is ON at any time during Steps 8 or 9, slip ring should be replaced and system rechecked. If GREEN lamp is now ON with new slip ring, system is now OK, if RED lamp is still ON, replace driver module wiring harness and install original slip ring.

Refer to specific procedures in this section of the manual. Do not attempt to repair wiring harness.

18. After any repair has been made it will be necessary to recheck system following Steps 8 and 9.

DRIVER MODULE - (Refer to Fig. 5-26)

WARNING: DRIVER AIR CUSHION MODULE SHOULD ALWAYS BE CARRIED WITH VINYL COVER AWAY FROM ALL PARTS OF ONE'S BODY AND SHOULD ALWAYS BE LAID ON A FLAT SURFACE WITH VINYL SIDE UP. THIS IS NECESSARY SO THAT A FREE SPACE IS PROVIDED TO ALLOW THE AIR CUSHION TO EXPAND IN CASE OF ACCIDENTAL DEPLOYMENT OTHERWISE, SERIOUS INJURY MAY RESULT.

Removal

WARNING: DO NOT ATTEMPT TO REPAIR ANY PORTION OF THE MODULE. THE MODULE MUST BE SERVICED AS A UNIT. ATTEMPTING REPAIRS SUCH AS SOLDERING WIRES, CHANGING COVERS, ETC. MAY CAUSE ACCIDENTAL INFLATION OR IMPAIR OPERATION OF DRIVER MODULE IN AN ACCIDENT.

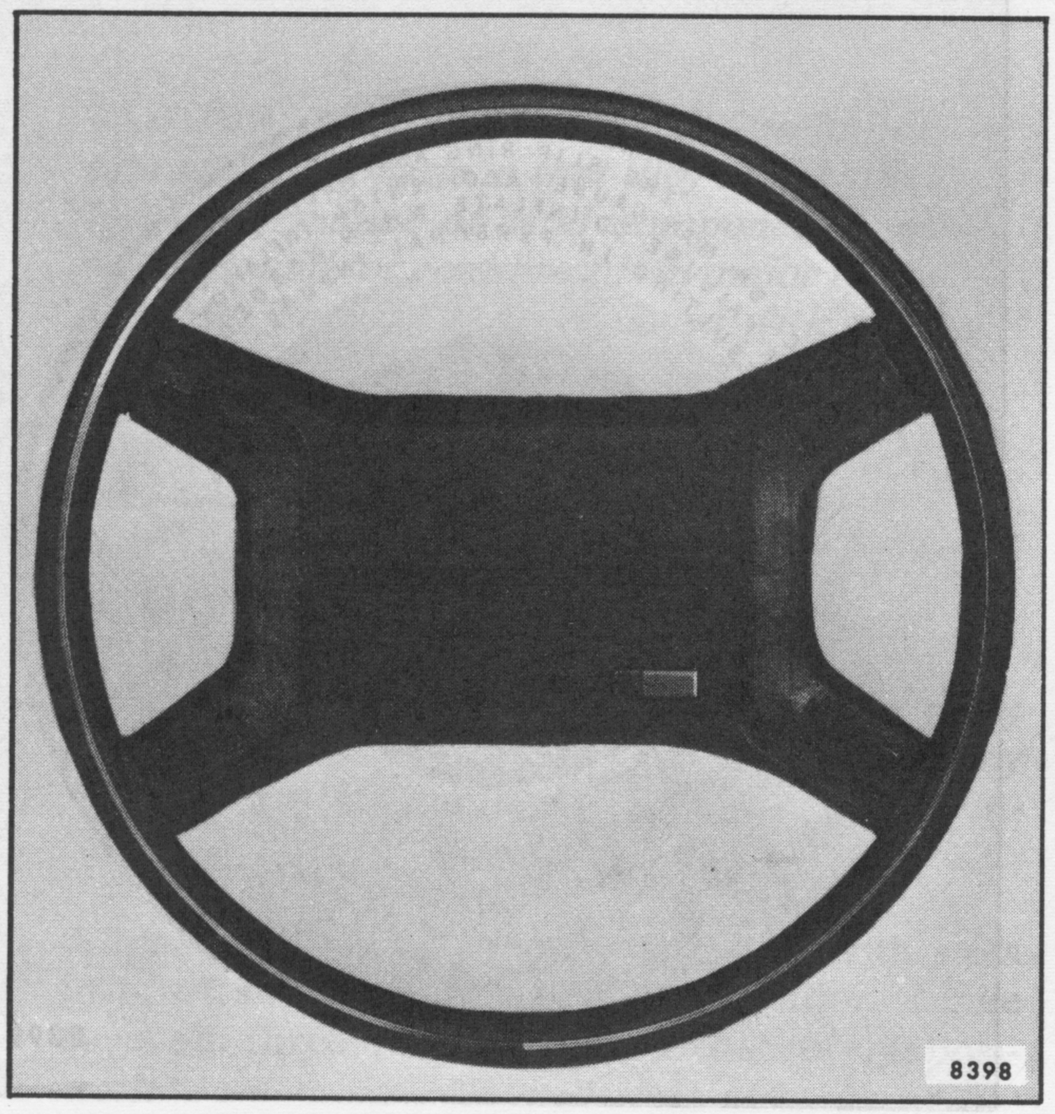

Fig. 5-26-Steering Wheel and Driver Module

1. Turn ignition switch to "LOCK" position. Disconnect the negative cable from the battery and tape end.

2. Remove four steering wheel module attaching screws using tool J- 24628-2, lift up module and disconnect horn wire, then using tool J- 24628-3, disconnect module wire connector from slip ring.

NOTE: If the driver air cushion module is to be replaced with a service part, refer to Section 6-Parts Disposal.

Installation

1. Position steering wheel with column and wheel alignment marks in 12:00 o'clock position. This will position the large oval opening for air cushion connector in the 6:00 o'clock position.

2. Hold module close to wheel with the emblem in the lower right hand corner.

3. Loop the air cushion electrical harness clockwise from the 11:00 o'clock position around guide to the 6:00 o'clock position. Install the air cushion module connector by pushing onto the column circuit firmly and checking to be sure the connector is fully locked (Fig. 5- 27).

4. Install horn wire connector by pushing in and turning clockwise.

5. Move module closer to wheel making sure the module harness stays looped around guide correctly. Hold the module against the wheel and install four screws with tool J-24628-2. Torque to 40 inch pounds.

NOTE: Do not use substitute screws.

6. Check driver module system with tester J-24628-4, refer to "Driver Module Resistance Tester" procedures.

7. Remove tape from negative battery cable, connect cable to battery and torque to 90 inch pounds.

8. Rotate ignition switch to any position but "LOCK".

9. Observe indicator lamp. If not okay, reconnect analyzer for diagnosis.

STEERING COLUMN SLIP RING

Removal

1. Remove drivers module. Refer to Removal procedures.

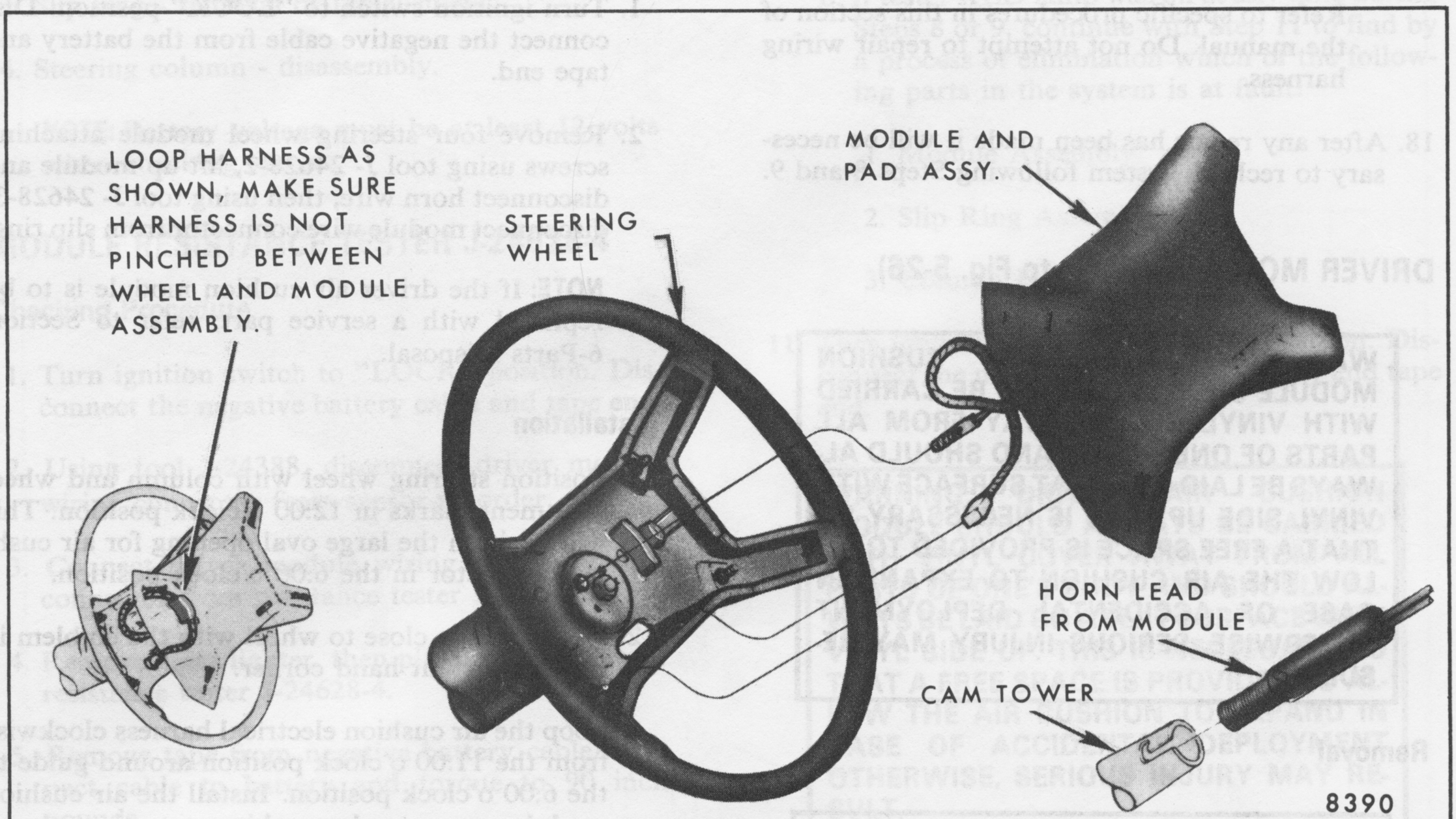
LOOP HARNESS AS SHOWN, MAKE SURE HARNESS IS NOT PINCHED BETWEEN WHEEL AND MODULE ASSEMBLY.
STEERING WHEEL
MODULE AND PAD ASSY.
HORN LEAD FROM MODULE
CAM TOWER
8390

Fig. 5-27-Driver Module Attachment

2. Remove steering wheel attaching nut, then remove steering wheel with tool BT-61-9 (Oldsmobile), J-3274 (Buick) or J-1859-03 (Cadillac) (Fig. 5-28).

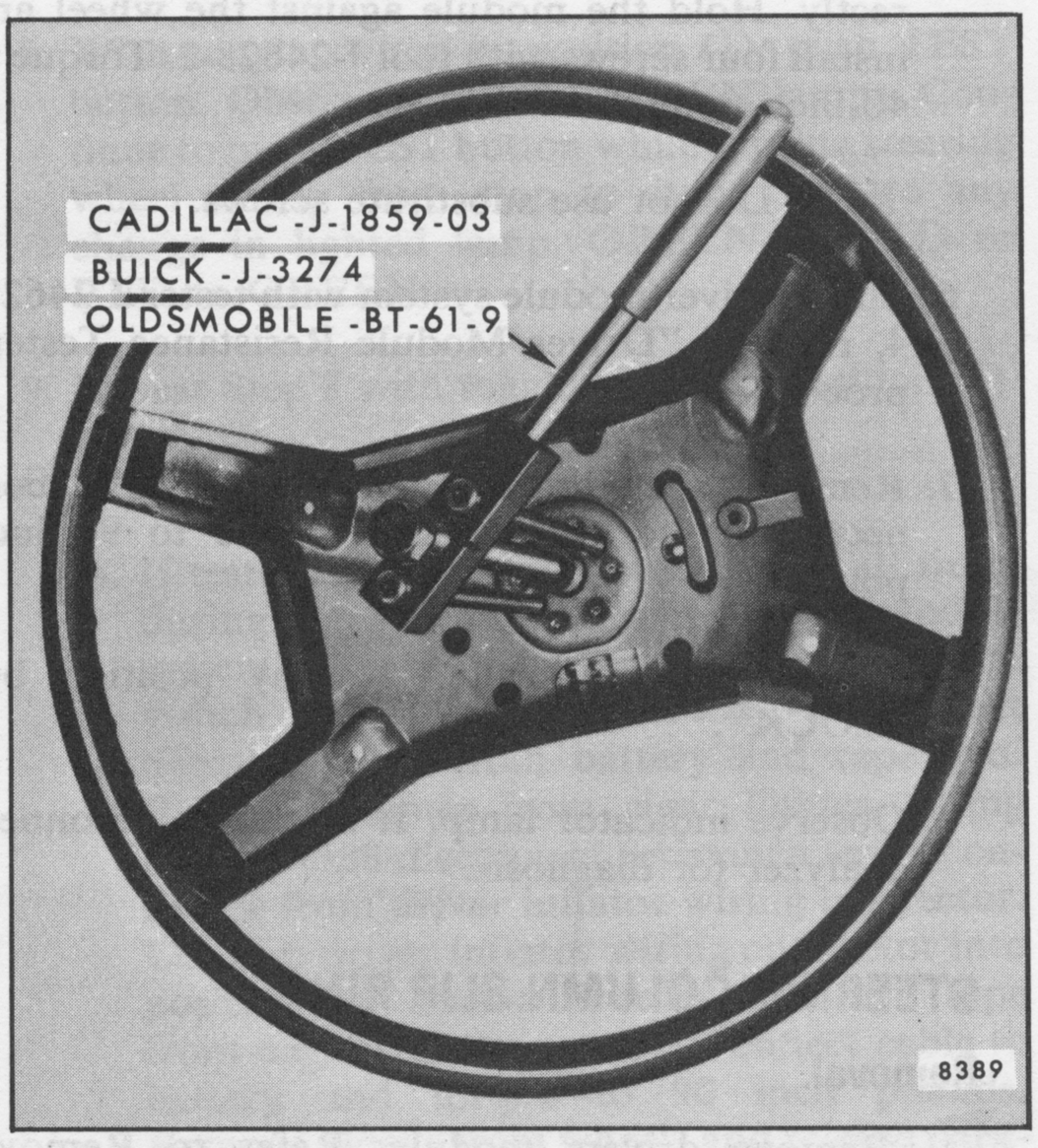

Fig. 5-28-Removing Steering Wheel - Oldsmobile Shown

DO NOT DISASSEMBLE OR LUBRICATE THE SLIP RING ASSEMBLY. EITHER ACTION MAY CAUSE ACCIDENTAL INFLATION OR FAILURE TO INFLATE WHEN NEEDED RESULTING IN PERSONAL INJURY.
8399

Fig. 5-29-Slip Ring Retainer and Cover

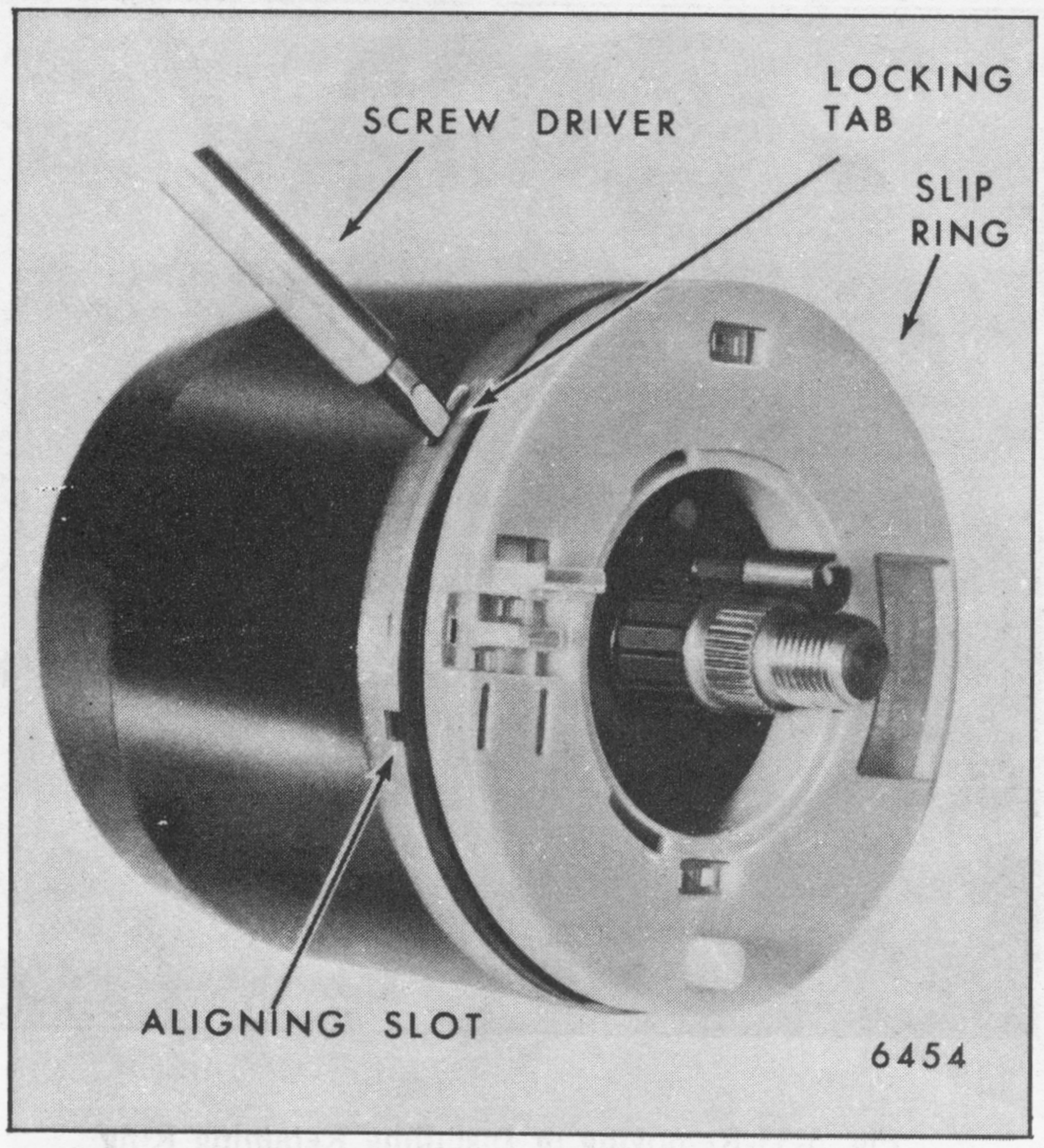

Fig. 5-30-Removing Slip Ring

3. Remove three screws from retainer and cover (Fig. 5-29). Carefully lift cover and retainer from column.

4. Carefully insert screwdriver blade into the three locking tabs (Fig. 5-30) and lift slip ring from column.

Installation

CAUTION: *All column fasteners are important attaching parts in that they could affect the performance of vital components and systems, and/or could result in major repair expense. They must be replaced with parts of the same part numbers if replacement becomes necessary. Do not use replacement parts of lesser quality or substitute design. Torque values must be used as specified during reassembly to assure proper retention of these parts.*

NOTE: The steering column slip ring assembly MUST NOT be lubricated or modified in any way. The slip ring must be serviced as an assembly.

1. Align three locating tabs on slip ring with slots in bowl and push slip ring into position. Make sure all three locking tabs are securely positioned.

2. Install cover and retainer, aligning cover over locating tab. Install screws and torque to 15 inch pounds.

Fig. 5-31-Installing Steering Wheel

3. With the alignment marks on the steering wheel hub and the steering shaft aligned, install the steering wheel and nut. Torque nut to 35 foot pounds (Fig. 5-31).

NOTE: If module assembly is not horizontal, it will be necessary to adjust the tie rod ends until steering wheel assumes its proper position.

4. Install driver module. Refer to Installation procedures.

5. Check driver module system with tester J-24628-4. Refer to "Driver Module Resistance Tester" procedures.

STEERING COLUMNS AND DRIVER MODULE HARNESS

NOTE: All elements of energy absorbing columns are sensitive to damage and must be handled with care.

Disassembly - Upper End - All (Includes Driver Module Harness)

Steps 1 through 14 can be performed with column in or out of the vehicle.

CAUTION: *Make sure column is not bent during removal from vehicle.*

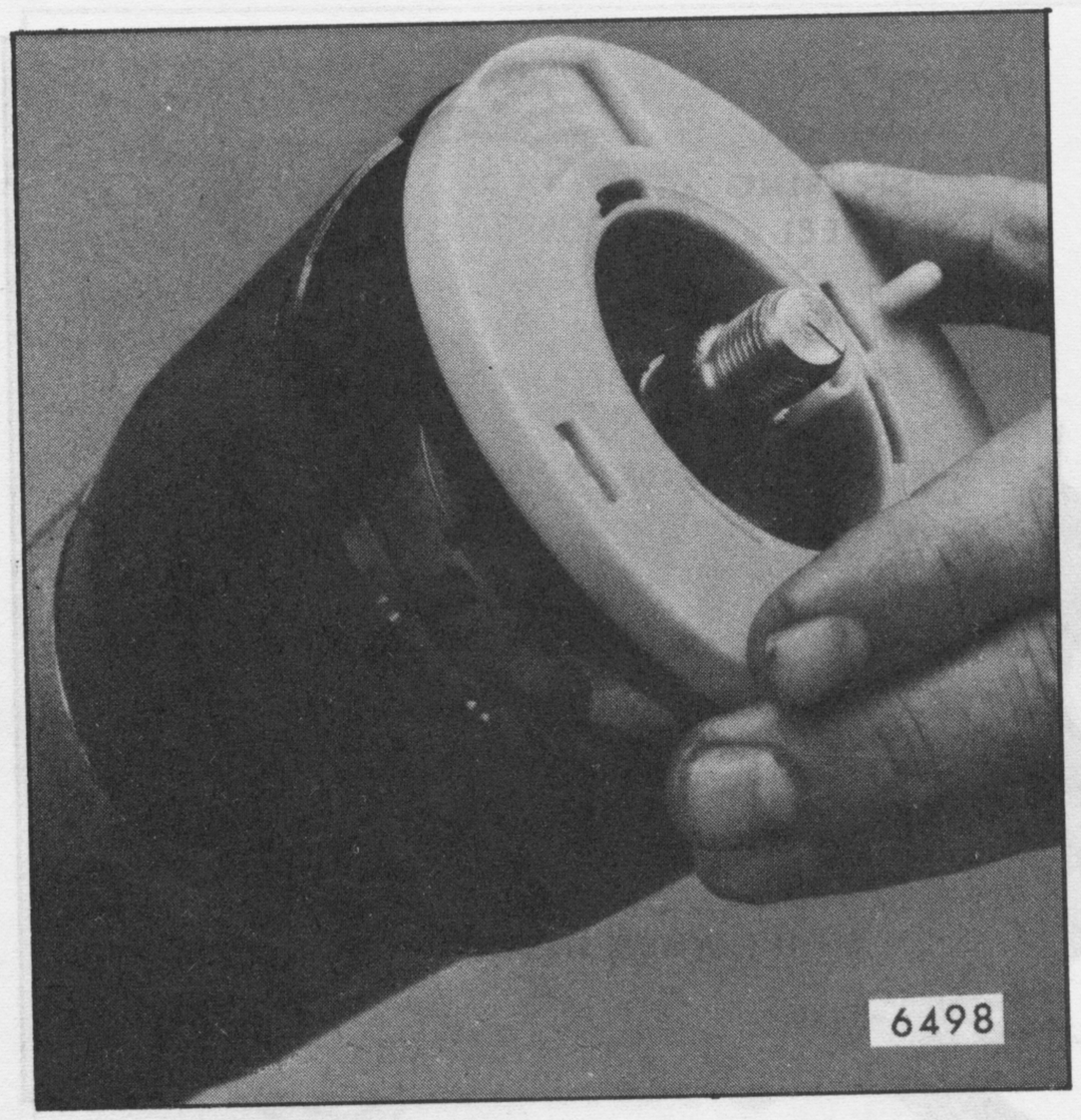

Fig. 5-32-Removing Slip Ring from Column

1. Remove driver module. Refer to Removal procedures.

2. Remove steering wheel attaching nut and remove steering wheel with tool BT-61-9 (Oldsmobile), J-3274 (Buick) or J-1859-03 (Cadillac) (Fig. 5-28).

3. Remove three screws from retainer and cover (Fig. 5-29). Carefully lift cover and retainer from column.

4. Carefully insert screwdriver blade depressing three locking tabs (Fig. 5-30) and lift slip ring from column (Fig. 5-32).

CAUTION: *Do not hammer on end of steering shaft as this could compress energy absorbtion feature in steering shaft.*

5. Depress lock plate downward as far as possible using special tool J-23131 or J-23653 and the steering wheel retaining nut. Pry the retaining ring out of the shaft groove (Fig. 5-33). Remove tool, retaining ring and lock plate (Fig. 5-34). Discard retaining ring.

CAUTION: *With ring removed, shaft could slide out bottom of column causing damage to shaft.*

6. Slide upper bearing preload spring and turn signal cancelling cam off upper steering shaft.

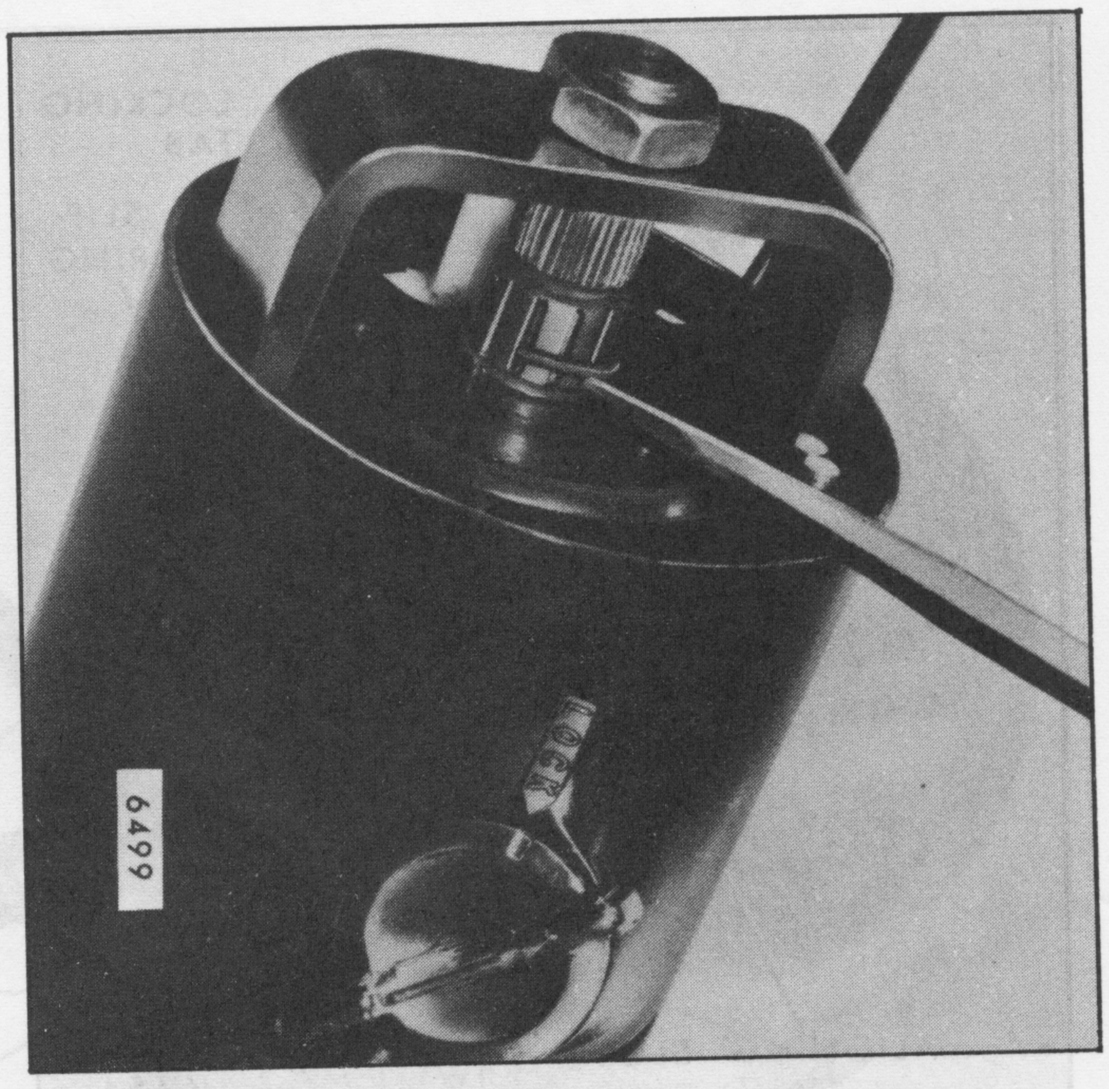

Fig. 5-33-Removing or Installing Retaining Ring

7. Slide thrust washer off upper steering shaft.

8. Remove turn signal lever by placing screwdriver blade between lever and retainer spring. With screwdriver still in place, pull lever sharply outward to remove.

9. Push hazard warning switch in and unscrew knob.

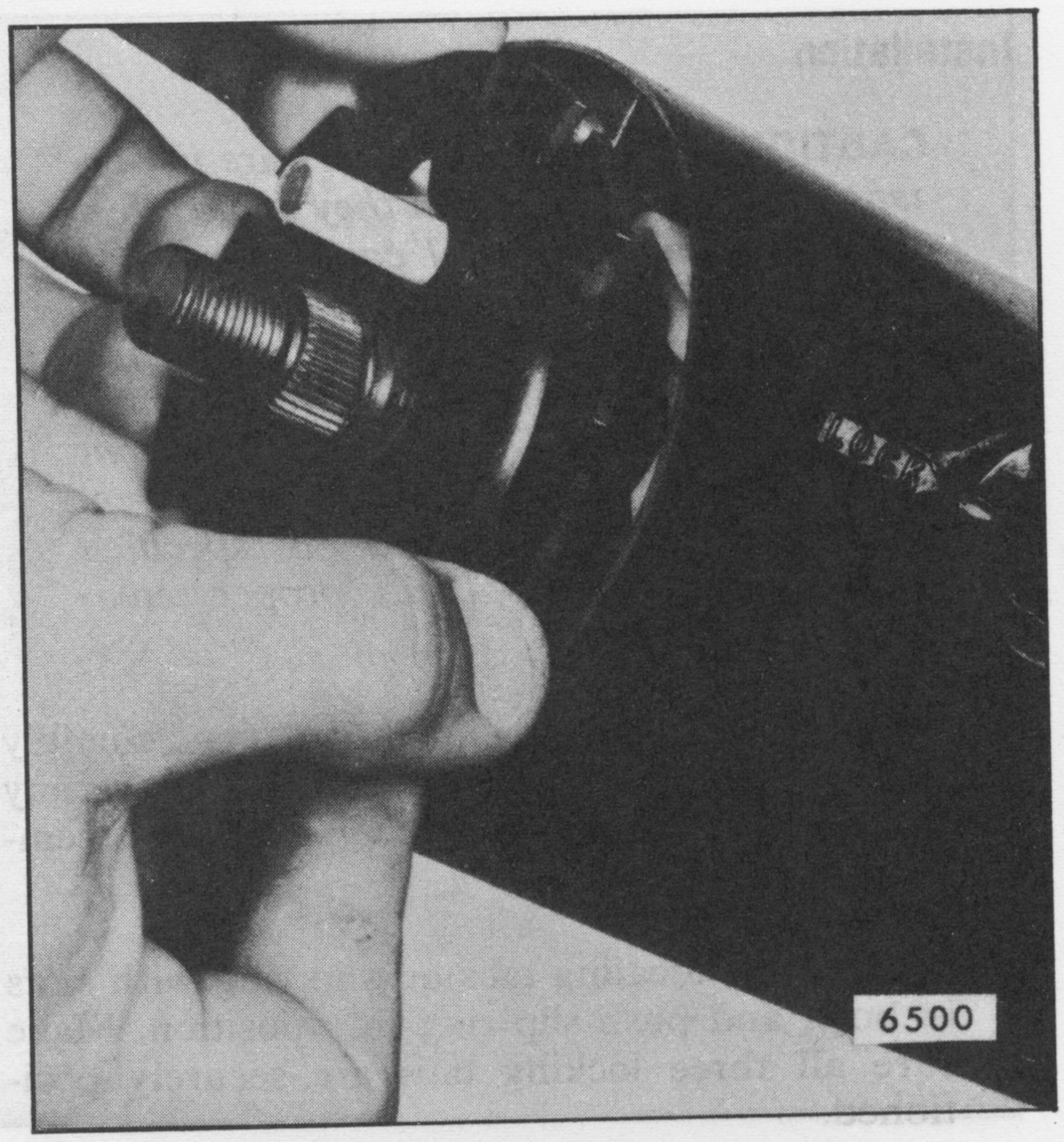

Fig. 5-34-Removing or Installing Lock Plate

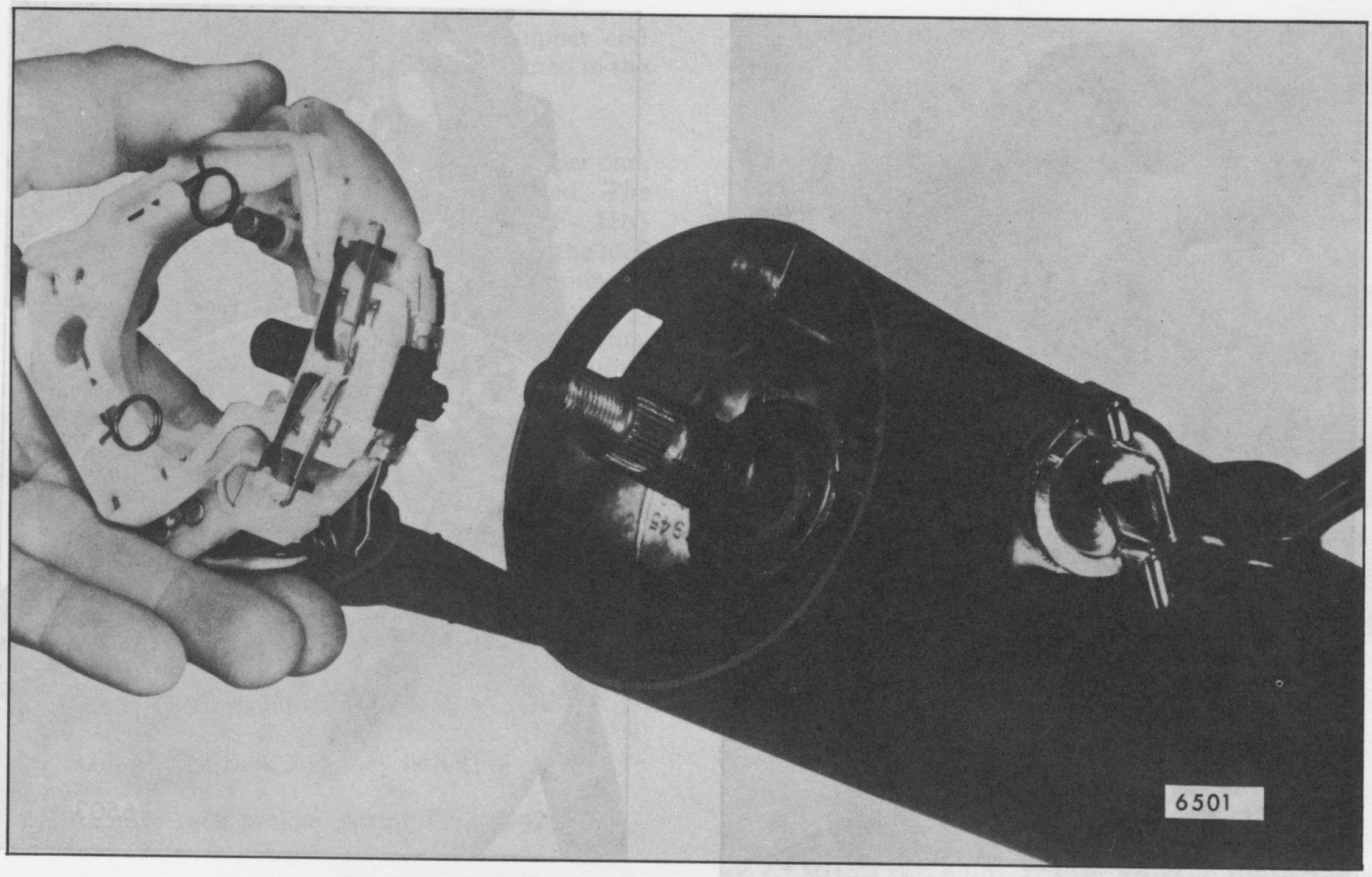

Fig. 5-35-Removing Switch Assembly

10. Remove three switch mounting screws. Remove the four mounting bracket screws and the bracket from the jacket. Pull the connector out of the bracket on the jacket. Remove the protector from the jacket and strip the wires from it.

11. Pull the switch straight up, being careful not to snag the signal switch wire connector in the housing (Fig. 5-35).

12. Slide Air Cushion Restraint System connector up to disengage from housing. Then, carefully pull cable assembly down through the housing and shift bowl (Fig. 5-36).

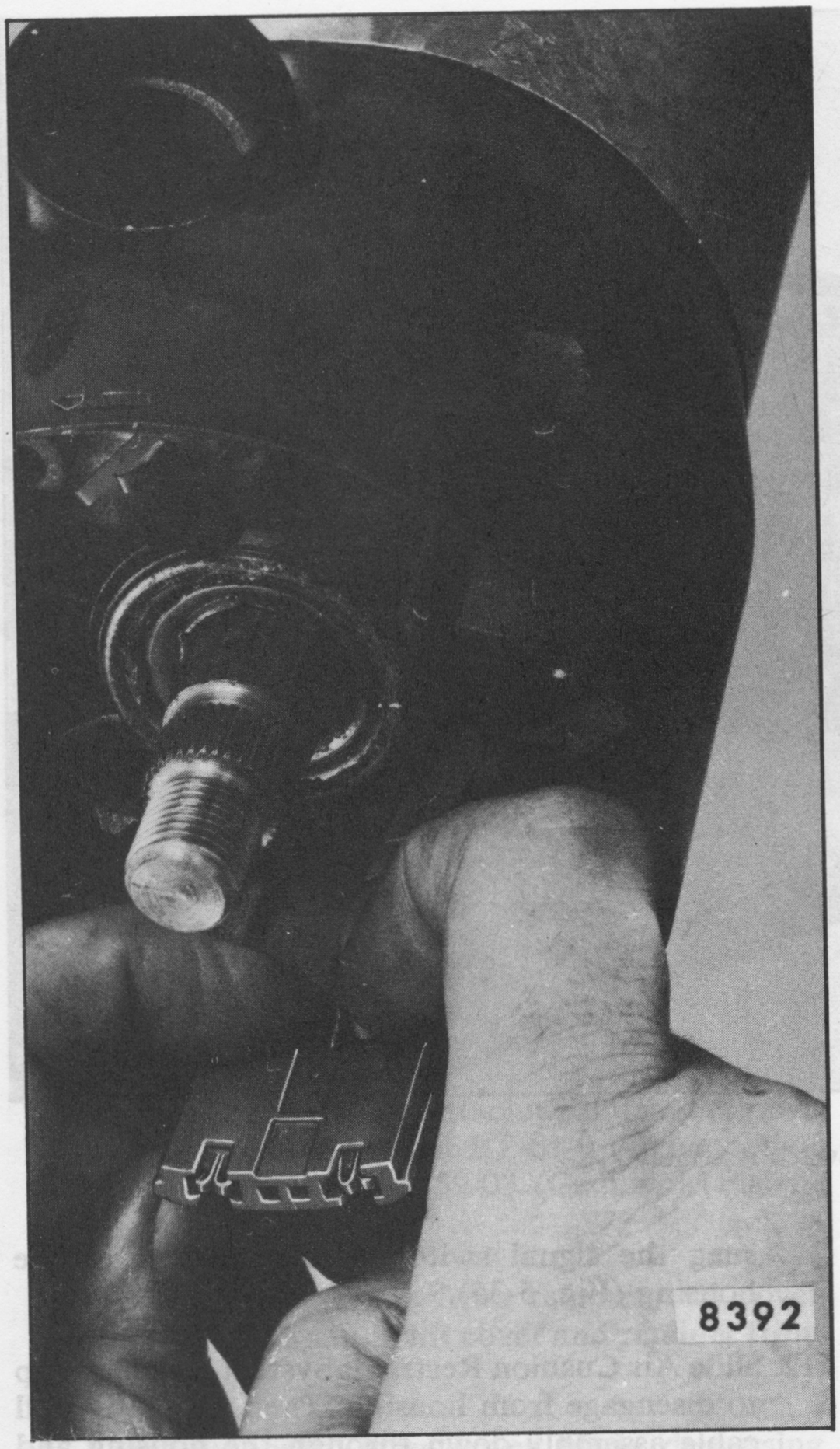

Fig. 5-36-Removing Air Cushion Restraint Wiring

13. The lock cylinder should be removed in the "RUN" position.

14. Remove lock cylinder by inserting a thin tool (small screwdriver of knife blade) into the slot next to the switch mounting screw boss (right hand slot) and depress retainer at bottom of slot, which releases lock. Remove lock (Fig. 5-37).

15. The buzzer switch can be pulled straight out of the housing. A flat spring wedges the switch toward the lock cylinder. (This may be done without the removal of the lock cylinder. If the lock cylinder is in the housing, it must be in the "RUN" position (Fig. 5-38).

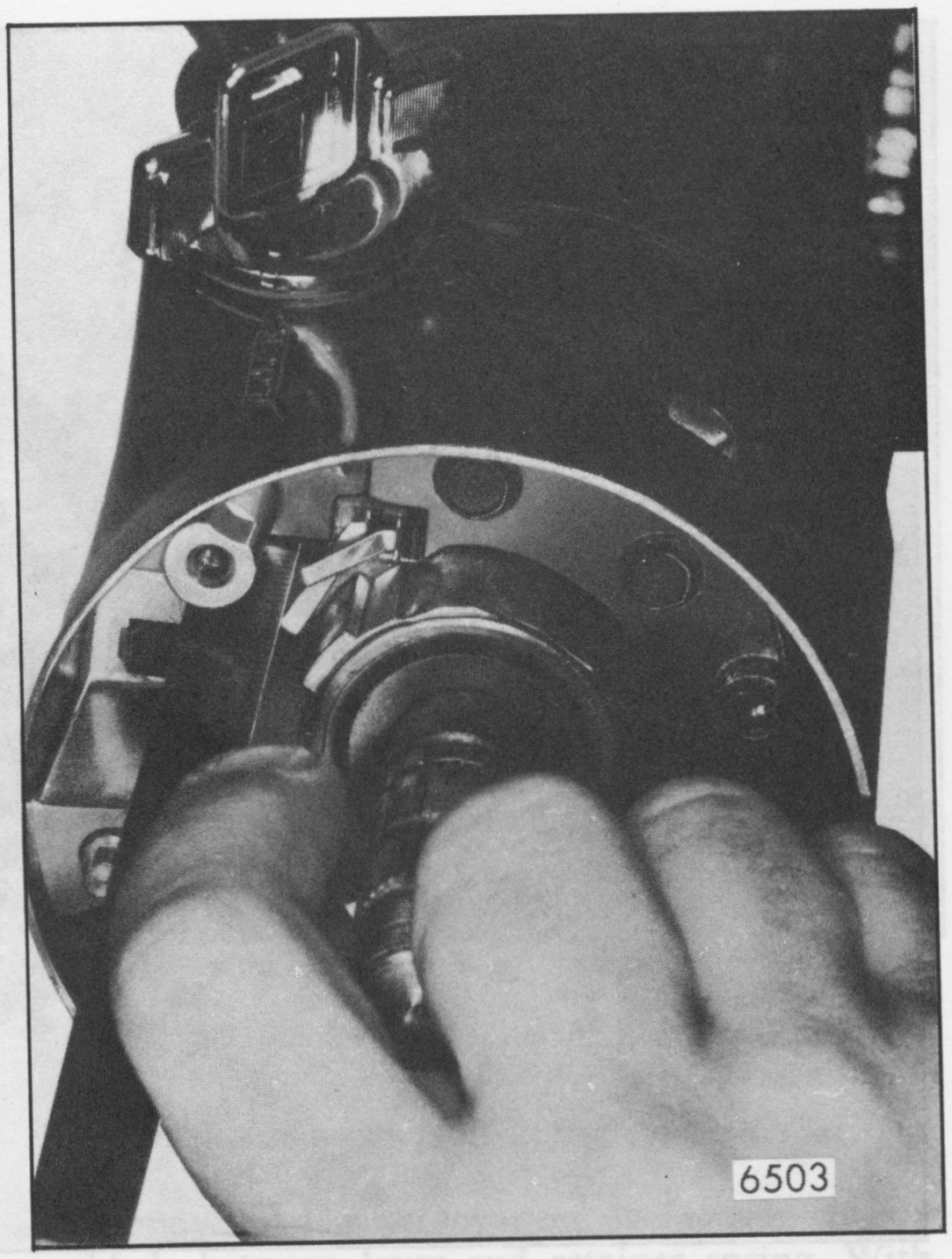

Fig. 5-37-Removing Lock

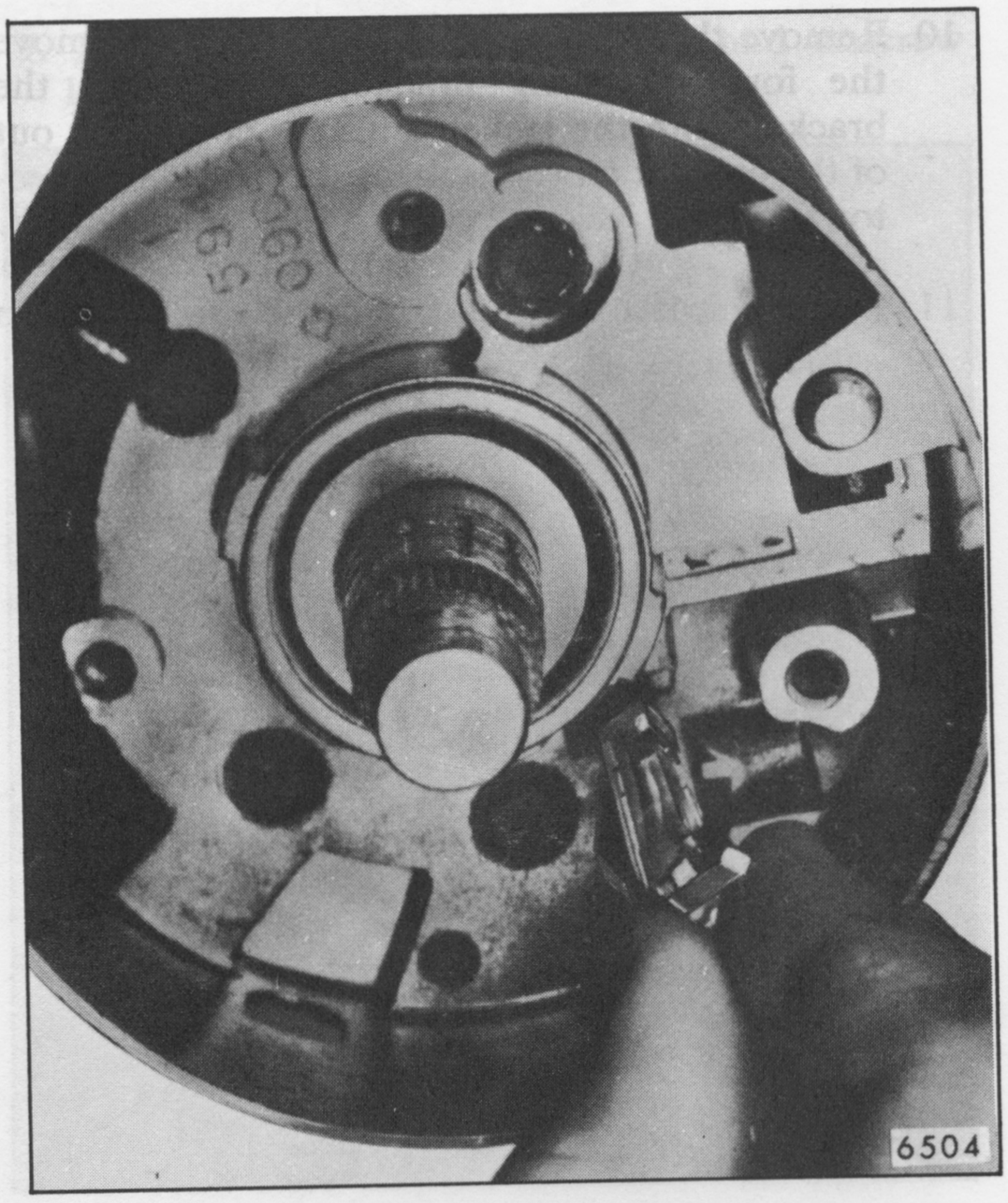

Fig. 5-38-Removing or Installing Buzzer Switch

NOTE: If service is required on the upper end only, Steps 1 through 14 can be performed in the vehicle.

16. To remove any further parts from the upper end, the ignition switch should be removed. The switch should be positioned in "OFF- UNLOCKED" position before removing. If the lock cylinder has already been removed, the connecting rods to the switch should be pulled up to a definite stop and then moved down two detents, which is the "OFF- UNLOCKED" position. Now remove the two attaching screws and the switch.

17. Drive out shift lever pivot pin and remove shift lever.

18. Remove the four screws attaching the upper housing to the jacket. Remove the upper housing assembly (Fig. 5-39).

19. Remove thrust cup (Fig. 5-40).

20. Remove the rack and lock bolt (Fig. 5-41).

21. Remove rack preload spring (Fig. 5-42).

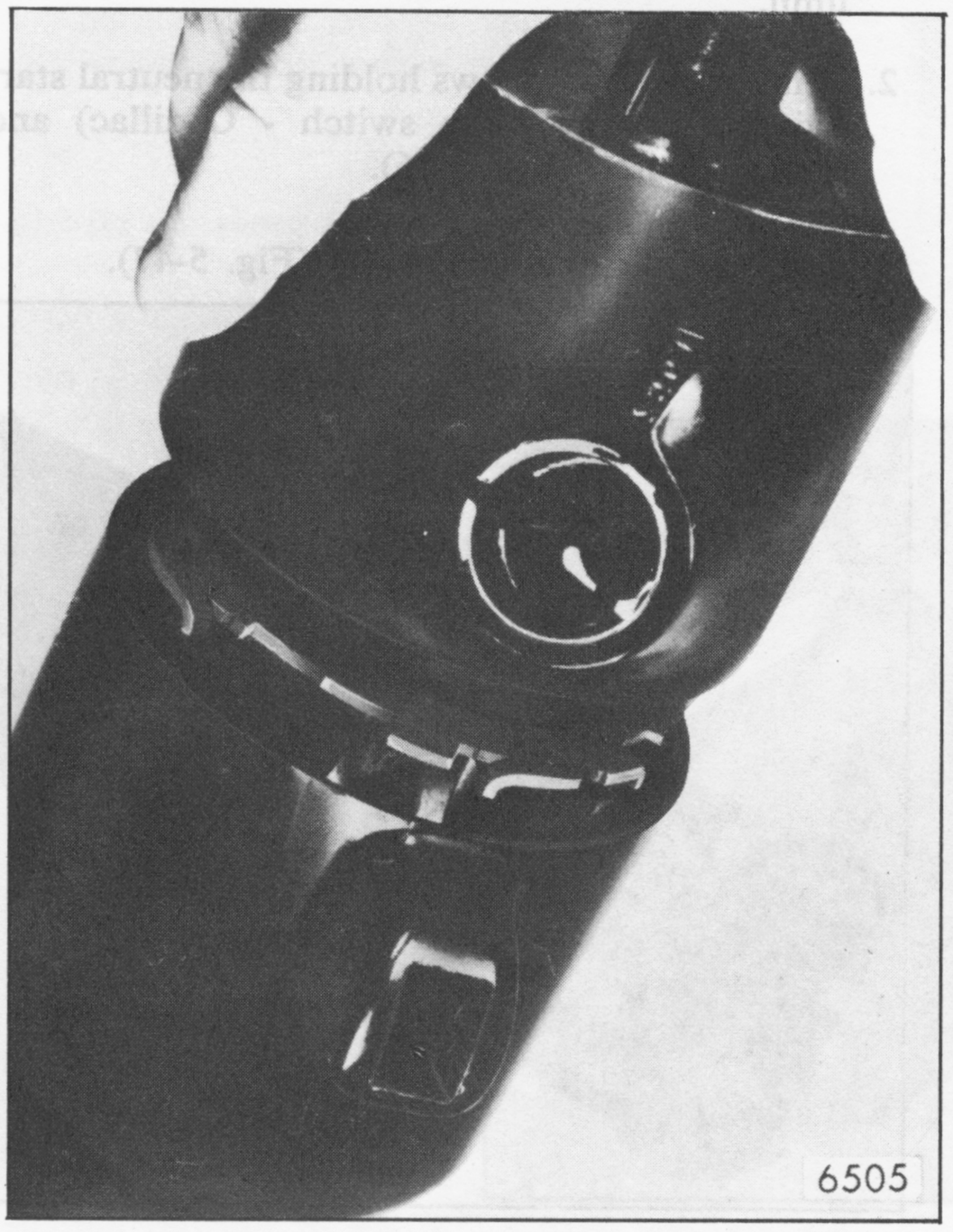

Fig. 5-39-Removing Upper Housing Assembly

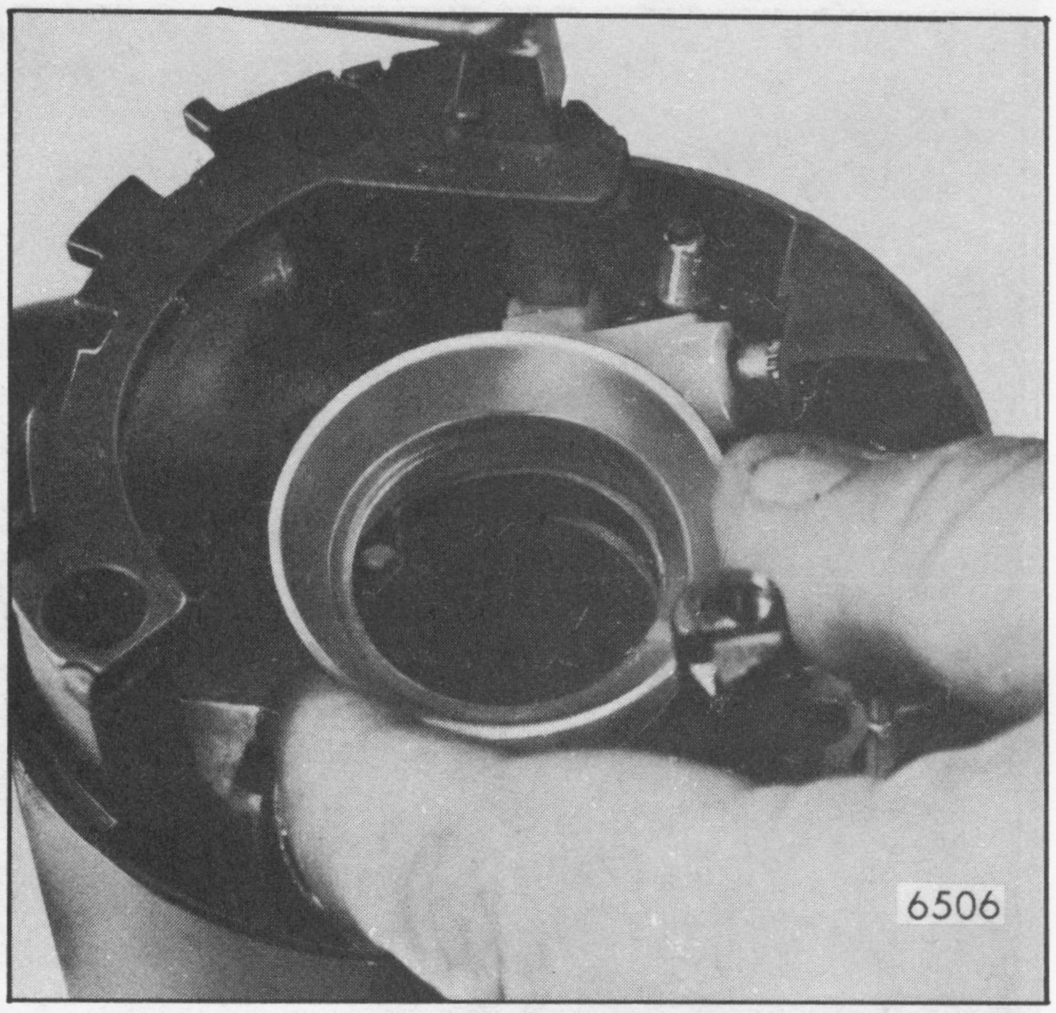

Fig. 5-40-Removing Thrust Cup

22. Remove the shift gate (Fig. 5-43).

NOTE: On Cadillac the shift gate is part of the housing.

23. Remove the sector through the lock cylinder hole by pushing firmly on the block tooth of the sector with a blunt punch (Fig. 5- 44).

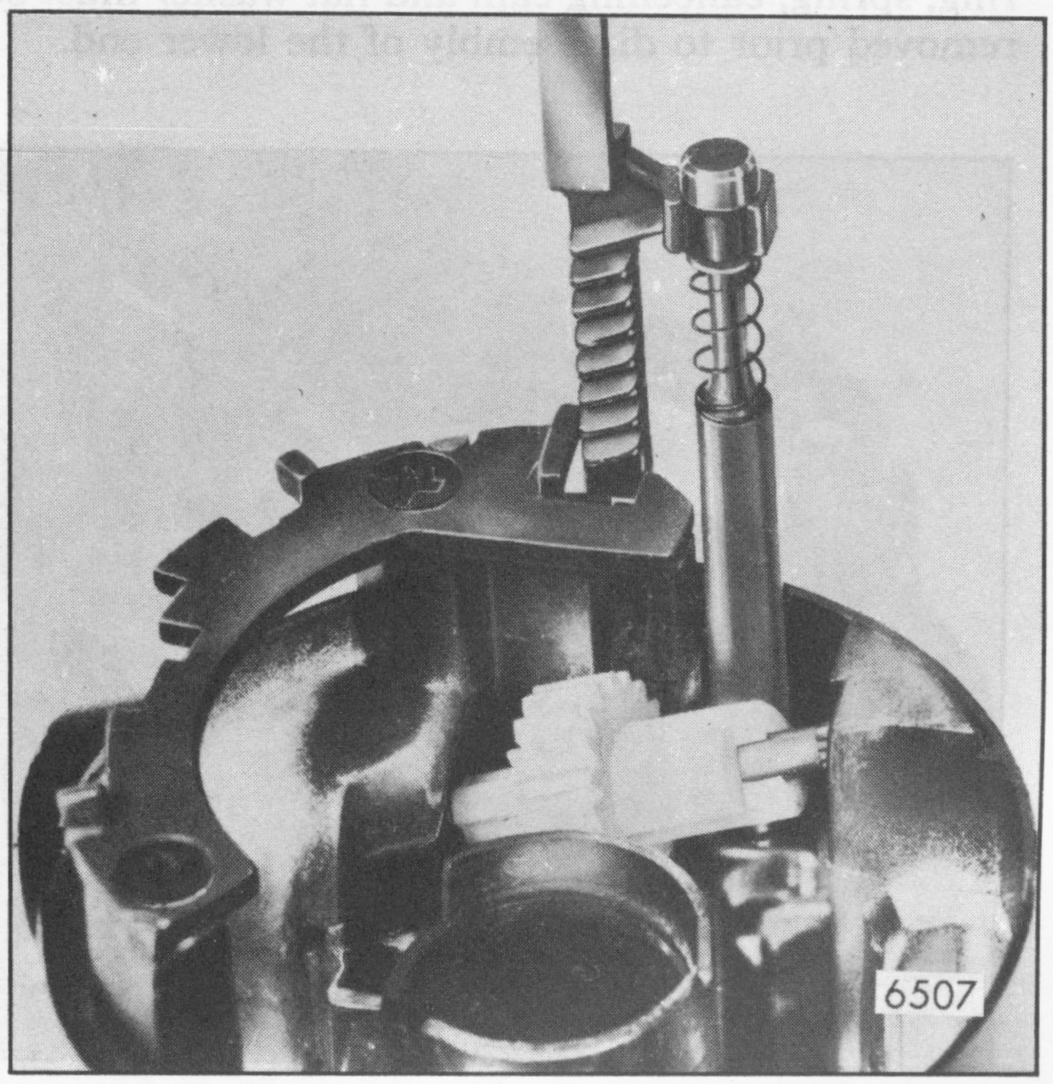

Fig. 5-41-Removing Rack and Lock Bolt

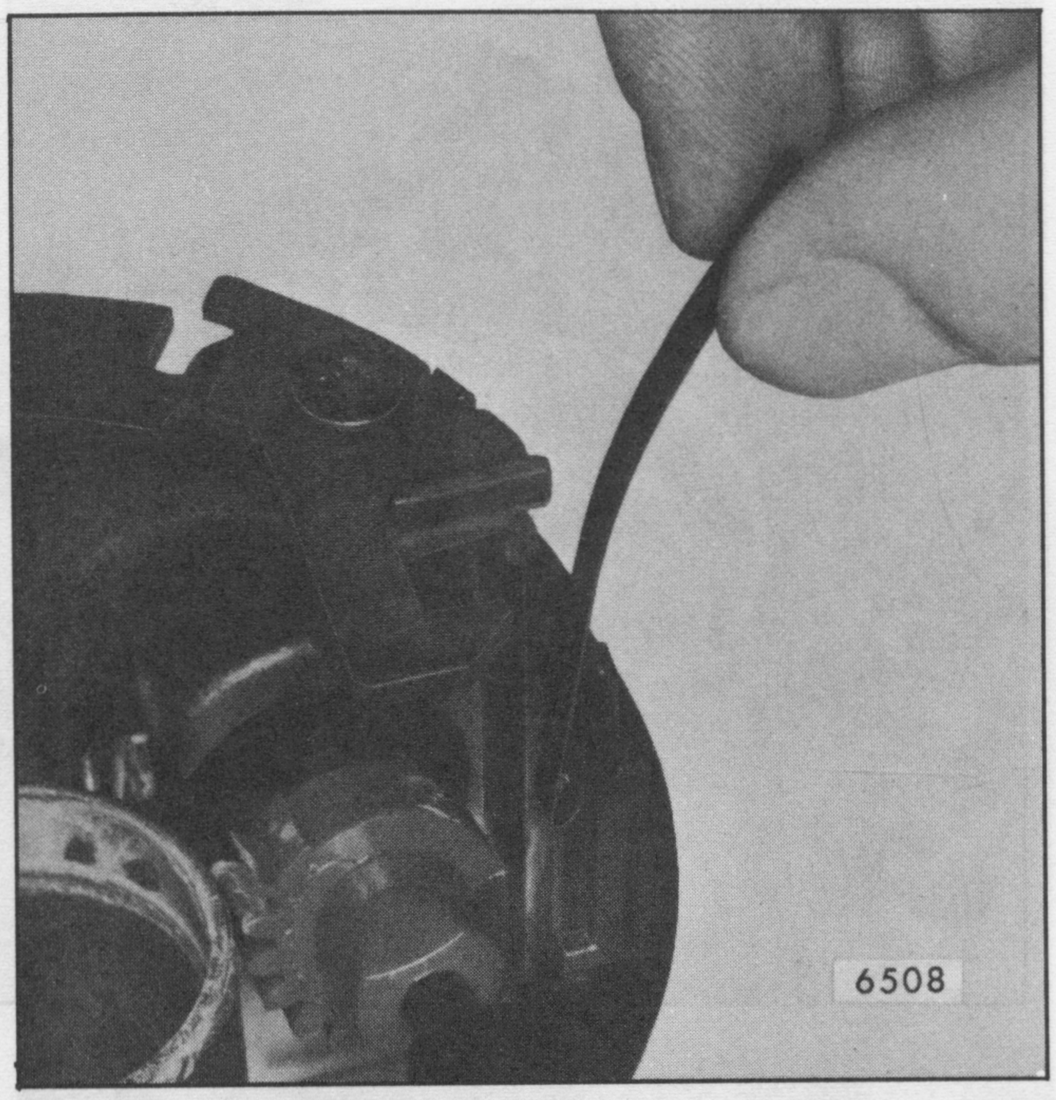

Fig. 5-42-Removing or Inserting Rack Preload Spring

24. Remove shift bowl and shroud from the jacket.

25. Remove lower bowl bearing from top of jacket (Fig. 5-45).

Disassembly - Lower End - Buick and Oldsmobile

Steering wheel, cover, slip ring, lock plate, retaining ring, spring, cancelling cam and flat washer must be removed prior to disassembly of the lower end.

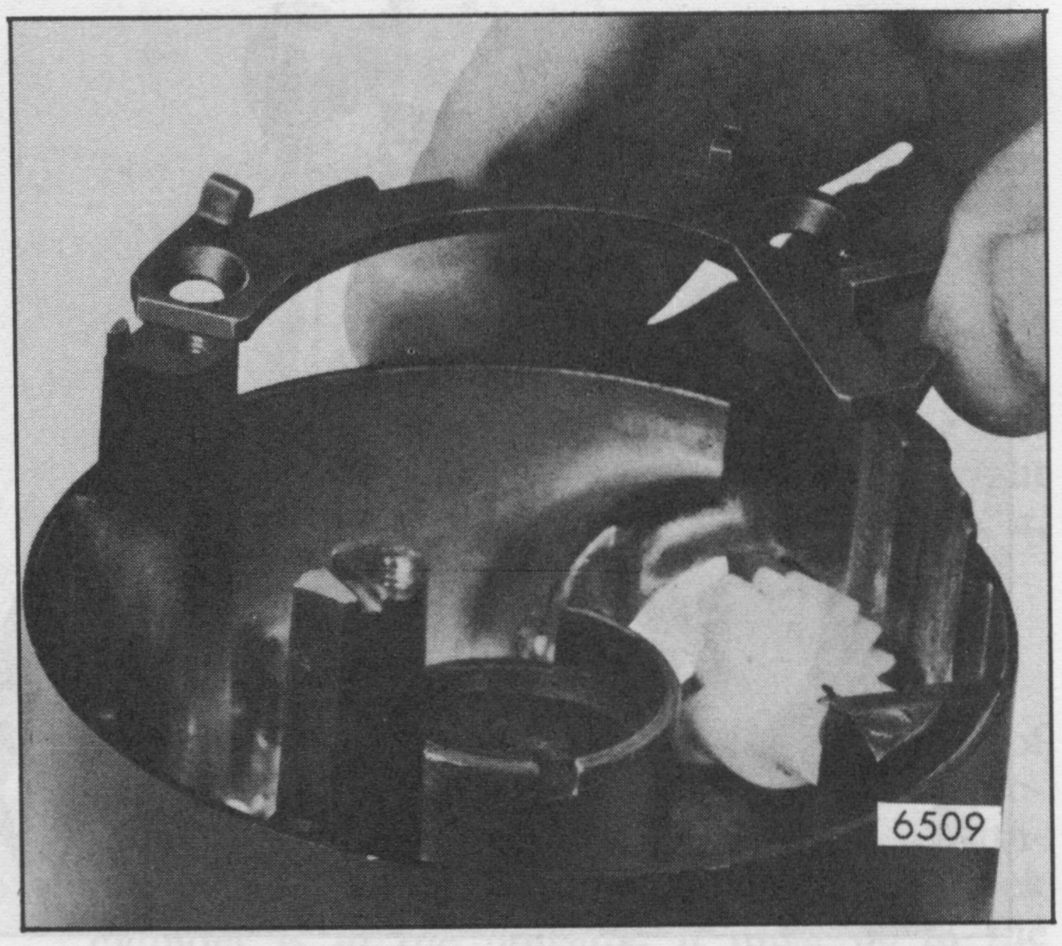

Fig. 5-43-Removing Shift Gate

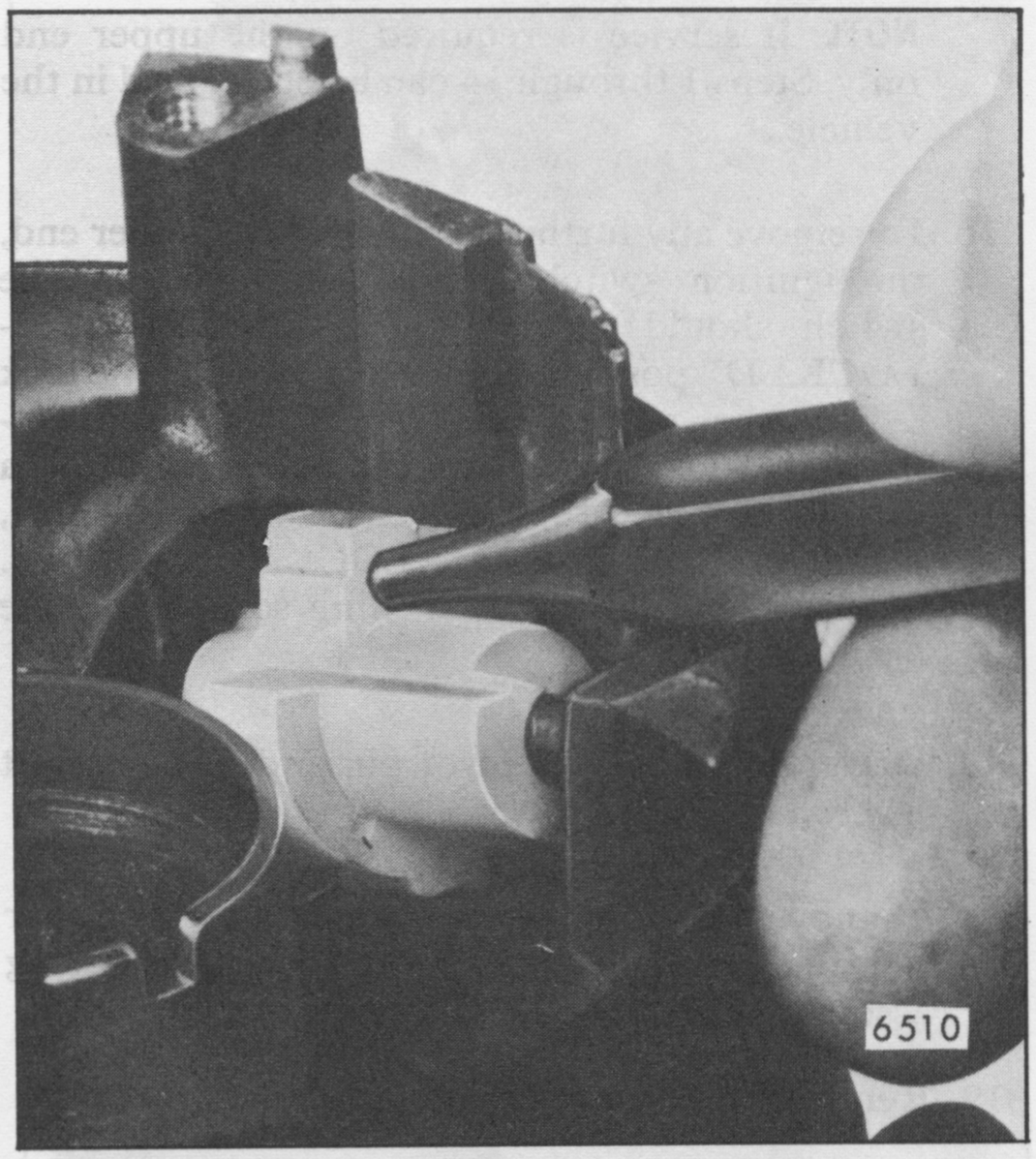

Fig. 5-44-Removing Sector

1. Pull steering shaft assembly from bottom of column.

2. Remove the two screws holding the neutral start switch (back-up lamp switch - Cadillac) and remove switch (Fig. 5-46).

3. Remove bearing adapter clip (Fig. 5-47).

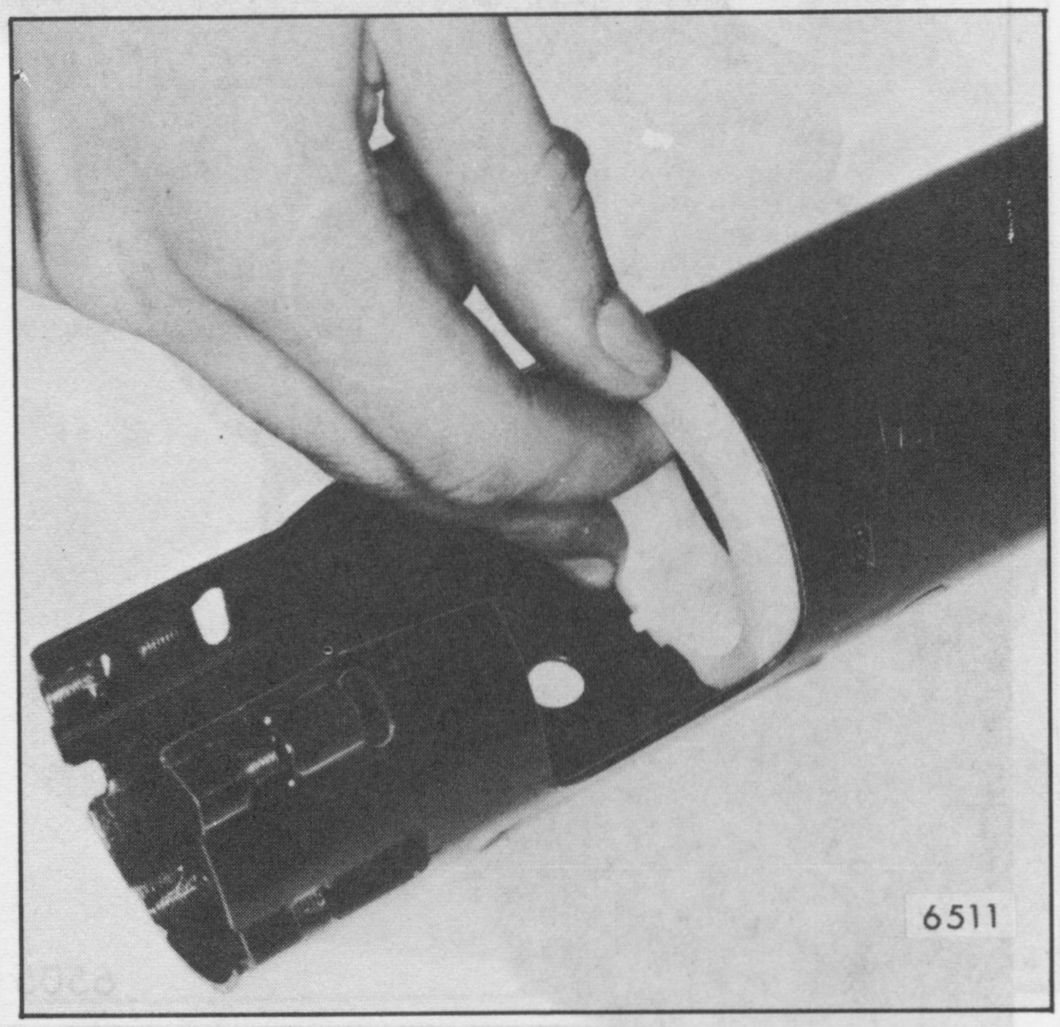

Fig. 5-45-Removing Lower Bowl Bearing

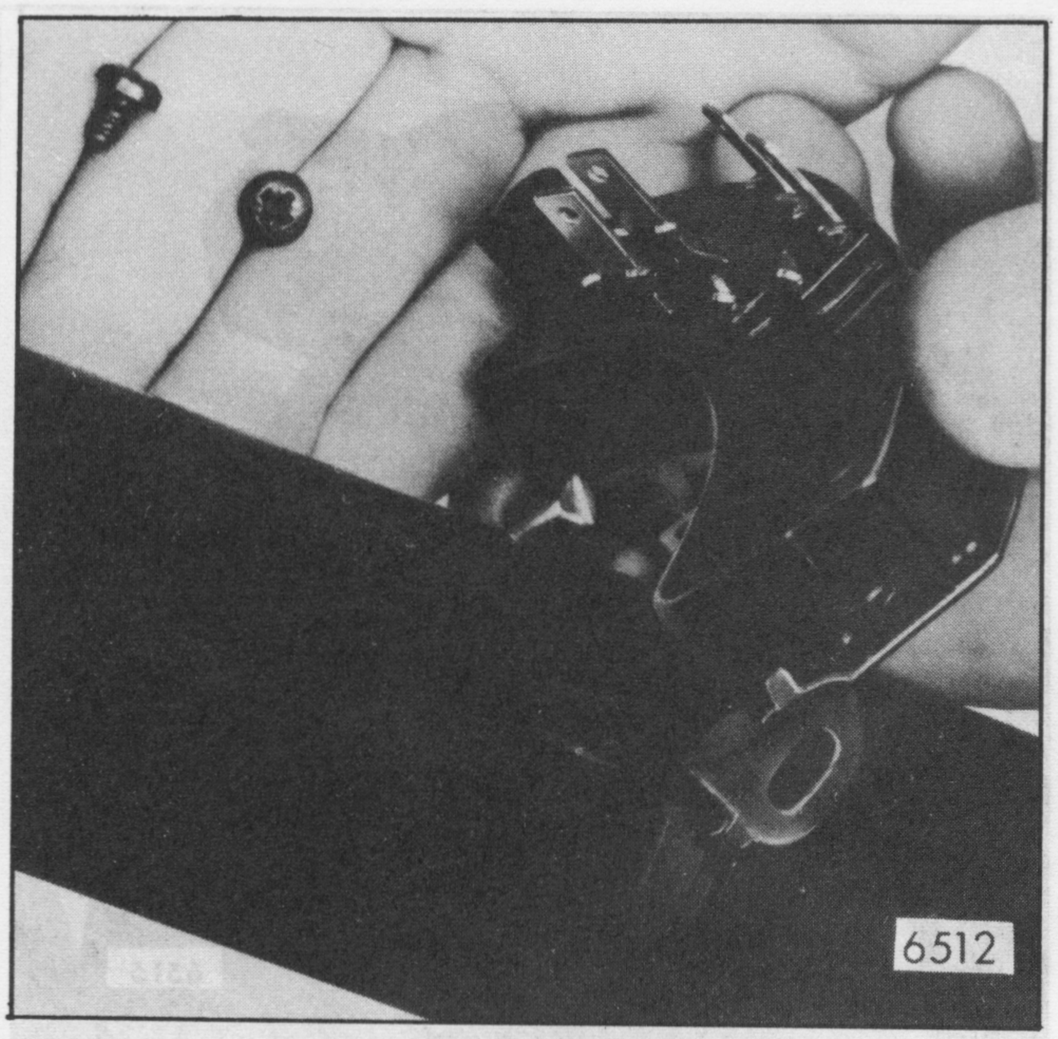

Fig. 5-46-Removing or Installing Neutral Start Switch - Cadillac Back-Up Lamp Switch Similar

4. Remove bearing retainer, bearing adapter and shift tube spring (Fig. 5-48). (Bearing may be removed from adapter by a light press-out operation on the outer race.)

Fig. 5-47-Removing Bearing Adapter Clip

5. Slide out shift tube assembly.

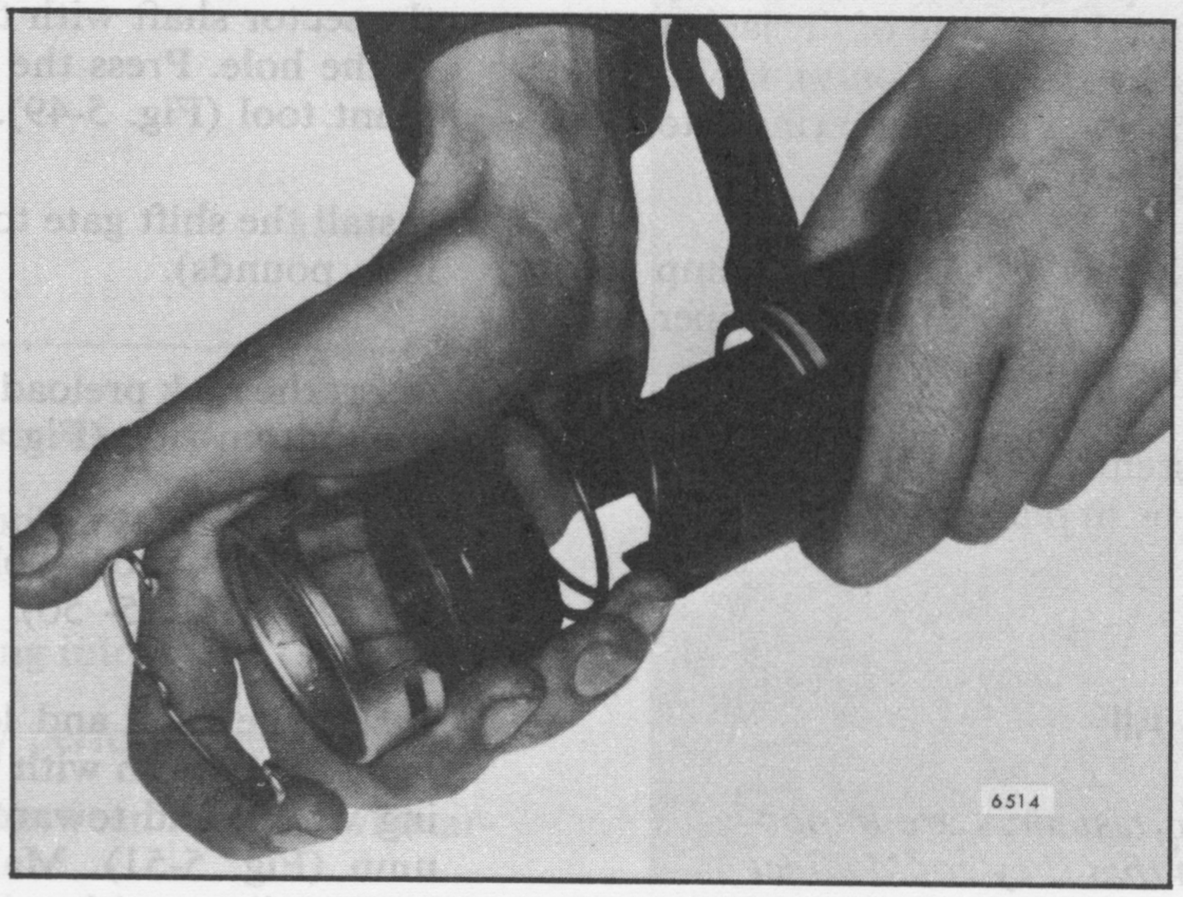

Fig. 5-48-Removing Bearing Adapter and Shift Tube Spring

Disassembly - Lower End - Cadillac Only

To remove shift tube, perform the following:

1. Remove shift tube washer, spacer and retaining ring.

2. Remove lower bearing retainer, bearing, adapter and clip.

   NOTE: Cadillac has no shift tube return spring.

3. Pull shift tube out of bottom end.

   NOTE: Cadillac has a wave washer between lower bowl bearing and bowl. This preloads shift mechanism.

Reassembly - Lower End - All

Apply a thin coat of lithium soap grease to all friction surfaces.

1. Press the lower bearing assembly into adapter assembly (if removed).

2. On Oldsmobile and Buick perform the following:

   a. Insert the shift tube assembly into the lower end of the jacket and rotate until the upper shift tube key slides into the bowl keyway.

3. On Cadillac perform the following:

   a. Shift tube must be assembled before installing housing. There is no shift tube return spring at bottom.

4. On all, assemble the spring adapter assembly bearing and retainer into the bottom of the jacket (install spacer and washer - Cadillac only). Holding the adapter in place, insert the snap ring into the jacket and mating retainer slots.

5. Install the neutral start switch (back-up lamp switch - Cadillac), making certain the proper screws are used (torque to 15 inch pounds).

6. Slide steering shaft assembly into column. (The upper housing should be in place before the shaft is assembled.)

Reassembly - Upper End - All

CAUTION: *All column fasteners are important attaching parts in that they could affect the performance of vital components and systems, and/or could result in major repair expense. They must be replaced with parts of the same part numbers if replacement becomes necessary. Do not use replacement parts of lesser quality or substitute design. Torque values must be used as specified during reassembly to assure proper retention of these parts.*

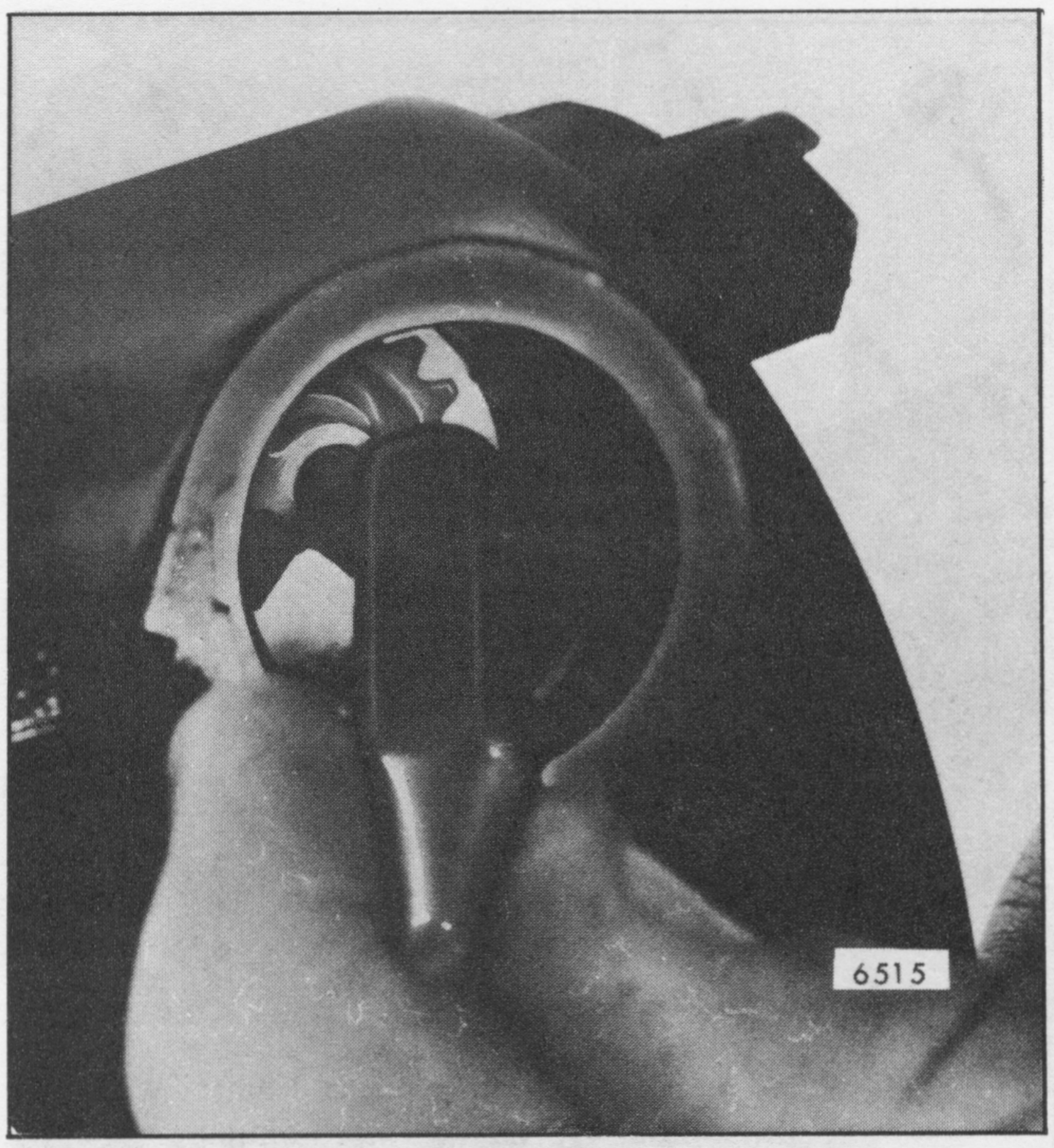

Fig. 5-49-Installing Sector

Apply a thin coat of lithium soap grease to all friction surfaces.

1. Install the sector in the lock cylinder hole over the sector shaft with the tang end to the outside of the hole. Press the sector over the pin with a blunt tool (Fig. 5-49).

2. Install the shift gate to the housing (torque to 45 inch pounds).

3. Insert the rack preload spring in the housing from the bottom side (Fig. 5-42).

4. Assemble the lock bolt to the cross-over arm of the rack (Fig. 5- 50).

5. Insert the rack and lock bolt into the housing from the bottom with the teeth up (toward steering wheel) and toward the centerline of the column (Fig. 5-51). Make certain wide tooth on sector aligns with wide gap at bottom end or rack.

Fig. 5-50-Assembling Bolt

6. Install the thrust cup on the bottom hub of the housing (Fig. 5-40).

7. Install lower bowl bearing into jacket (Fig. 5-45).

8. On Cadillac styles only perform the following:

   a. Install wave washer between lower bowl bearing and bowl.

   b. Install shift tube retaining clip.

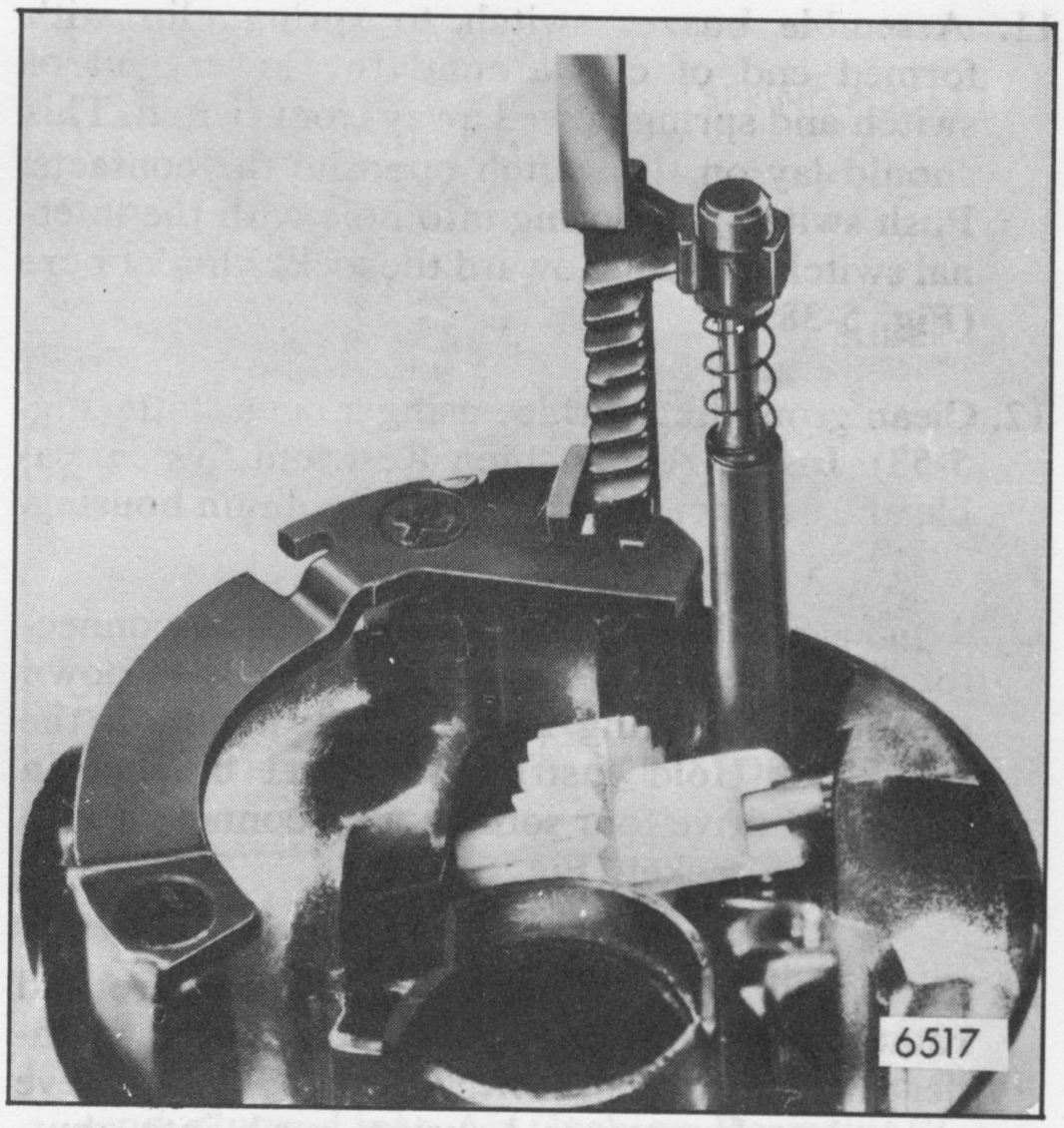

Fig. 5-51-Installing Rack and Lock Bolt

9. On all styles, install bowl and rotate it to be sure it is seated in bearing.

10. With the bowl in place, install the upper bearing housing assembly on the jacket.

    The bowl should be in the "PARK" position and the rack pulled downward. Be sure the housing is seated on the jacket and drive the screws (torque to 60 inch pounds) (Fig. 5-52).

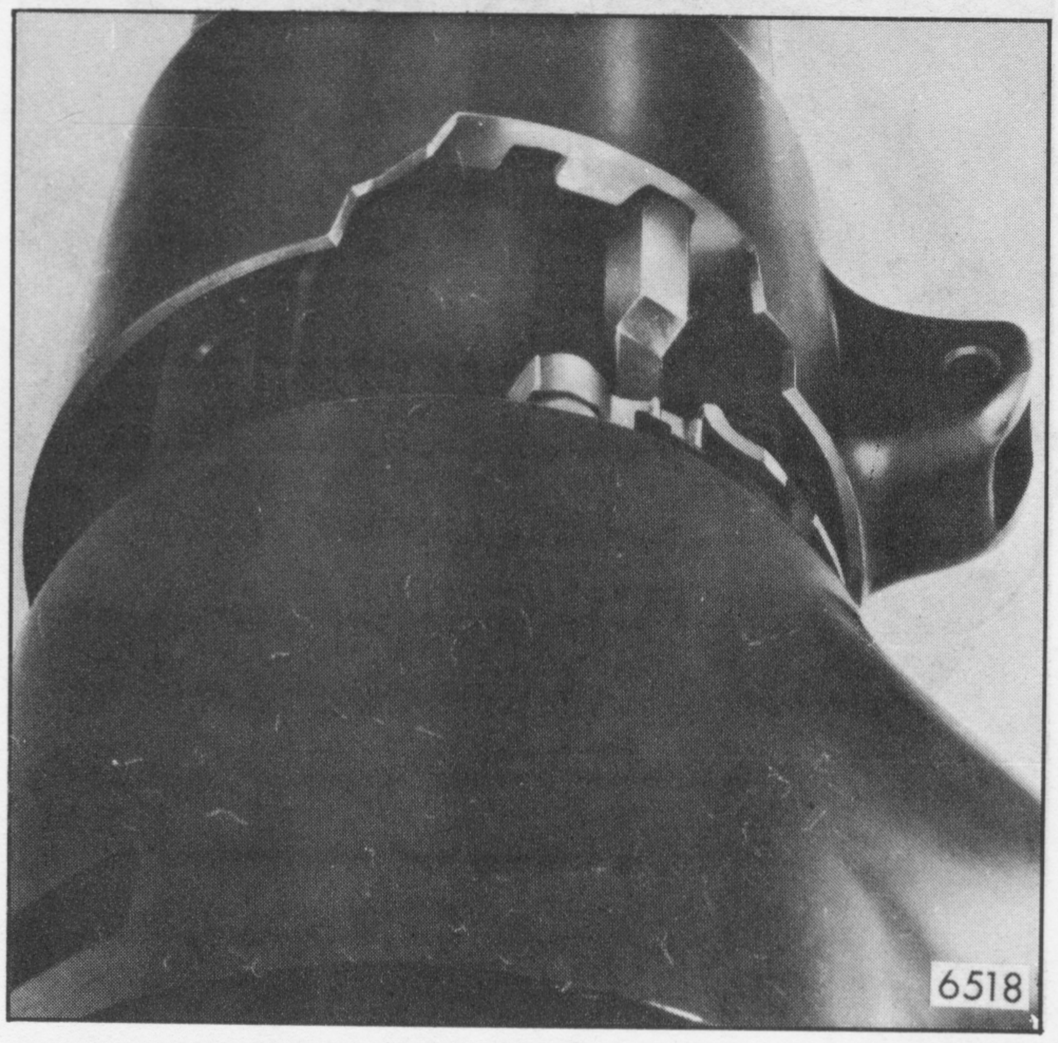

Fig. 5-52-Installing Upper Bearing Housing Assembly

11. Assemble buzzer switch to spring clip with formed end of clip around the lower end of switch and spring bowed away from switch. This should lay on the switch opposite the contacts. Push switch and spring into hole with the internal switch contacts toward the lock cylinder bore (Fig. 5-38).

12. Clean grounding surface using crocus cloth (Fig. 5-53). Install Air Cushion Restraint System cable and seat connector firmly in column housing.

13. Replace the turn signal switch. Feed the connector (bend wires as shown in Fig. 5-54) down through the housing. Assemble the wires into the protector. Hold instrument panel bracket in place and drive four screws. Clip connector into bracket on jacket (Fig. 5-55).

14. To install lock, hold lock cylinder sleeve and rotate knob clockwise against stop. Insert cylinder into housing bore with key on cylinder sleeve aligned to keyway in housing, push into abutment of cylinder and sector. Rotate knob counterclockwise, maintaining a light push inward on cylinder, until drive section of cylinder mates with sector. Push in until retainer pops into grooves and lock cylinder is secured in housing. Check freedom of rotation.

15. On Buick and Oldsmobile styles perform the following:

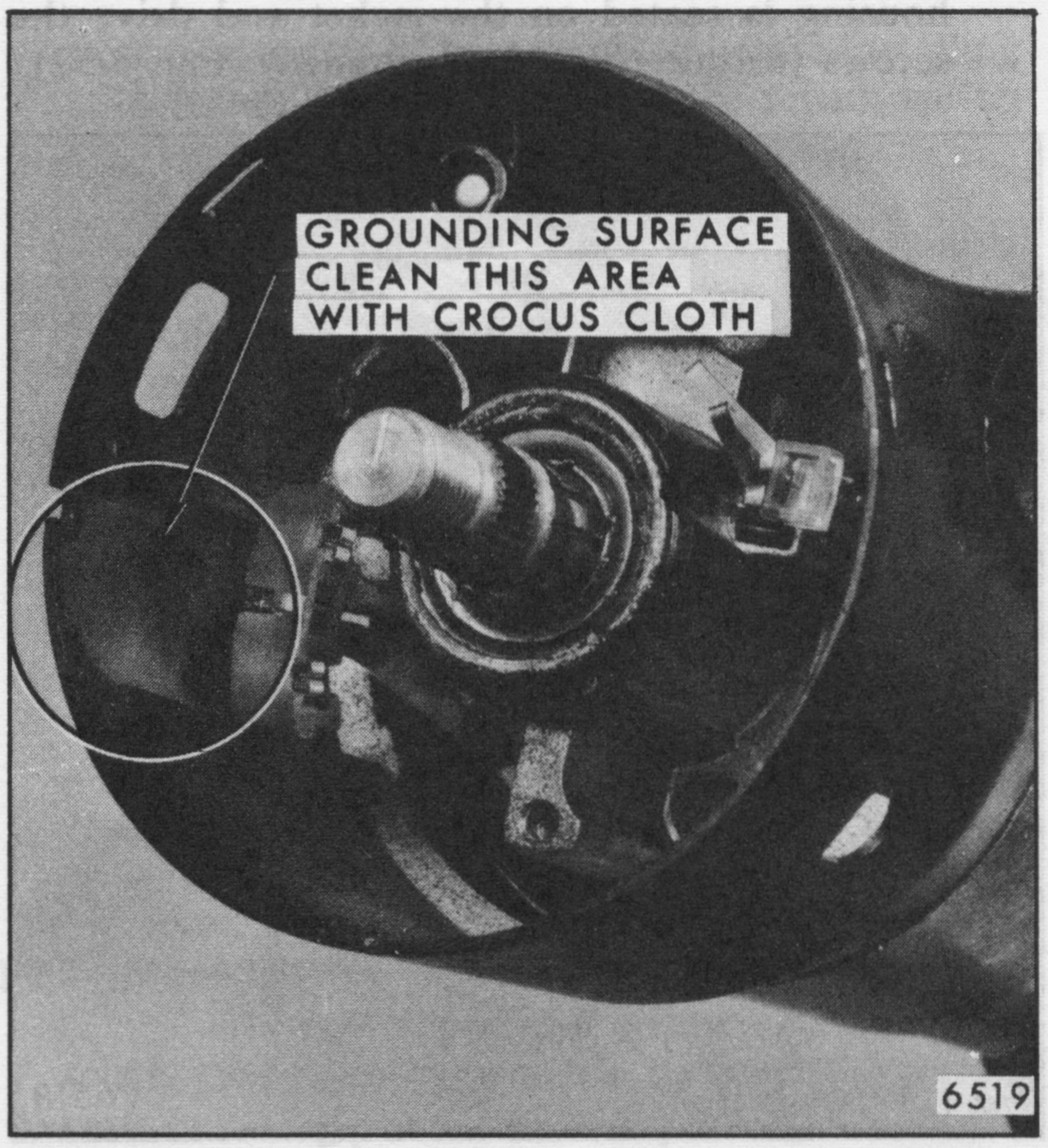

Fig. 5-53-Cleaning Grounding Surface

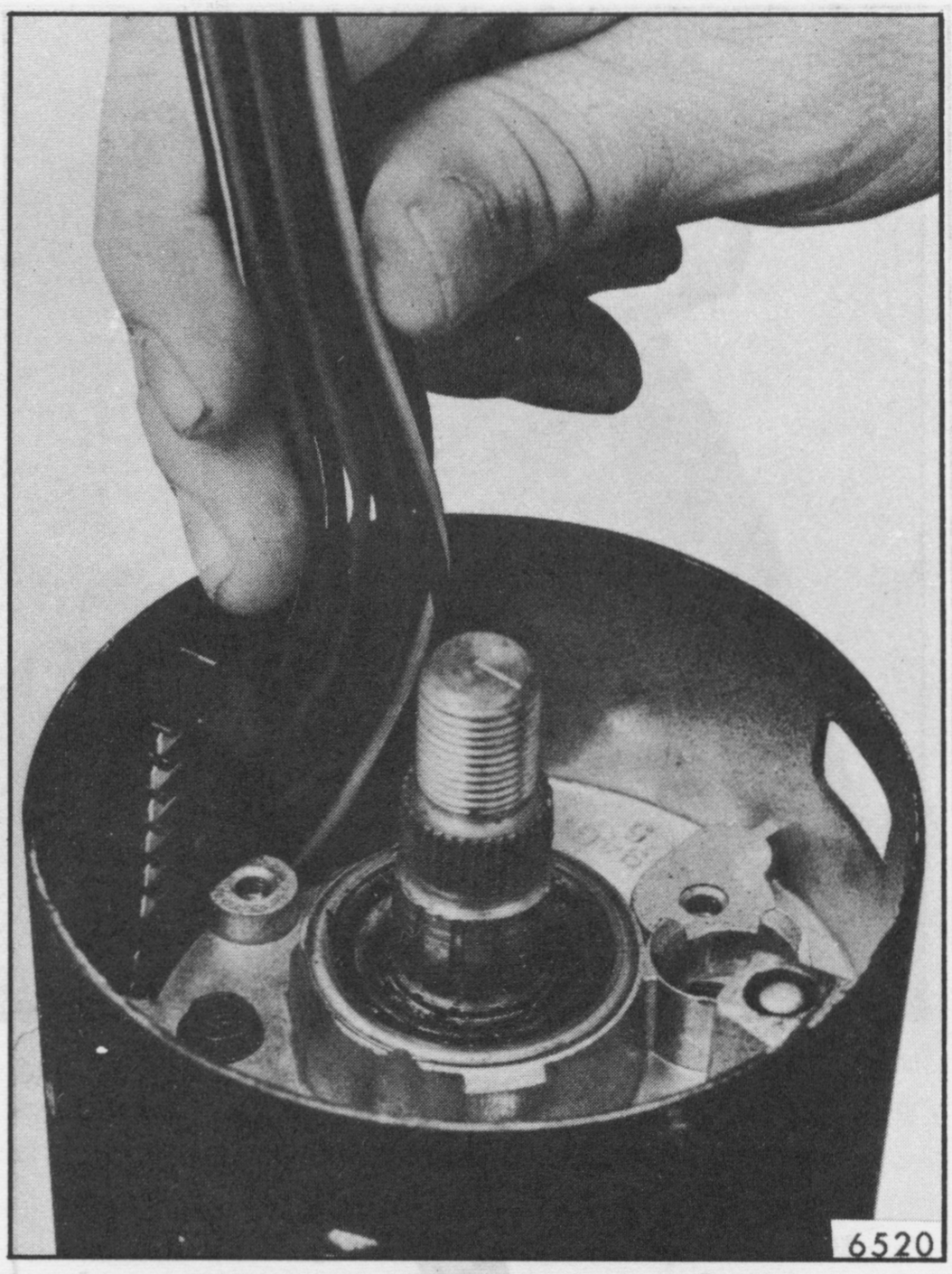

Fig. 5-54-Replacing Turn Signal Switch

a. When replacing the ignition switch, place the shift bowl in any position except "PARK" and rotate the lock counterclockwise until the rack bottoms against the lower surface of the cast in bowl plate. Place the ignition switch in the "OFF-UNLOCKED" position by the following procedure.

   Position the switch as it is shown in Figure 5-56.

   Move the slider to the extreme left (ACCESSORY).

   the slider two positions to the right from "ACCESSORY" to the "OFF-UNLOCK" position.

   Fit the actuator rod into the slider hole and assemble to the column with two screws. Caution should be exercised to prevent moving the switch out of detent. Use only the correct screws. Tighten to 35 inch pounds.

16. On Cadillac styles when replacing or adjusting ignition switch perform the following:

   a. Set switch in "OFF".

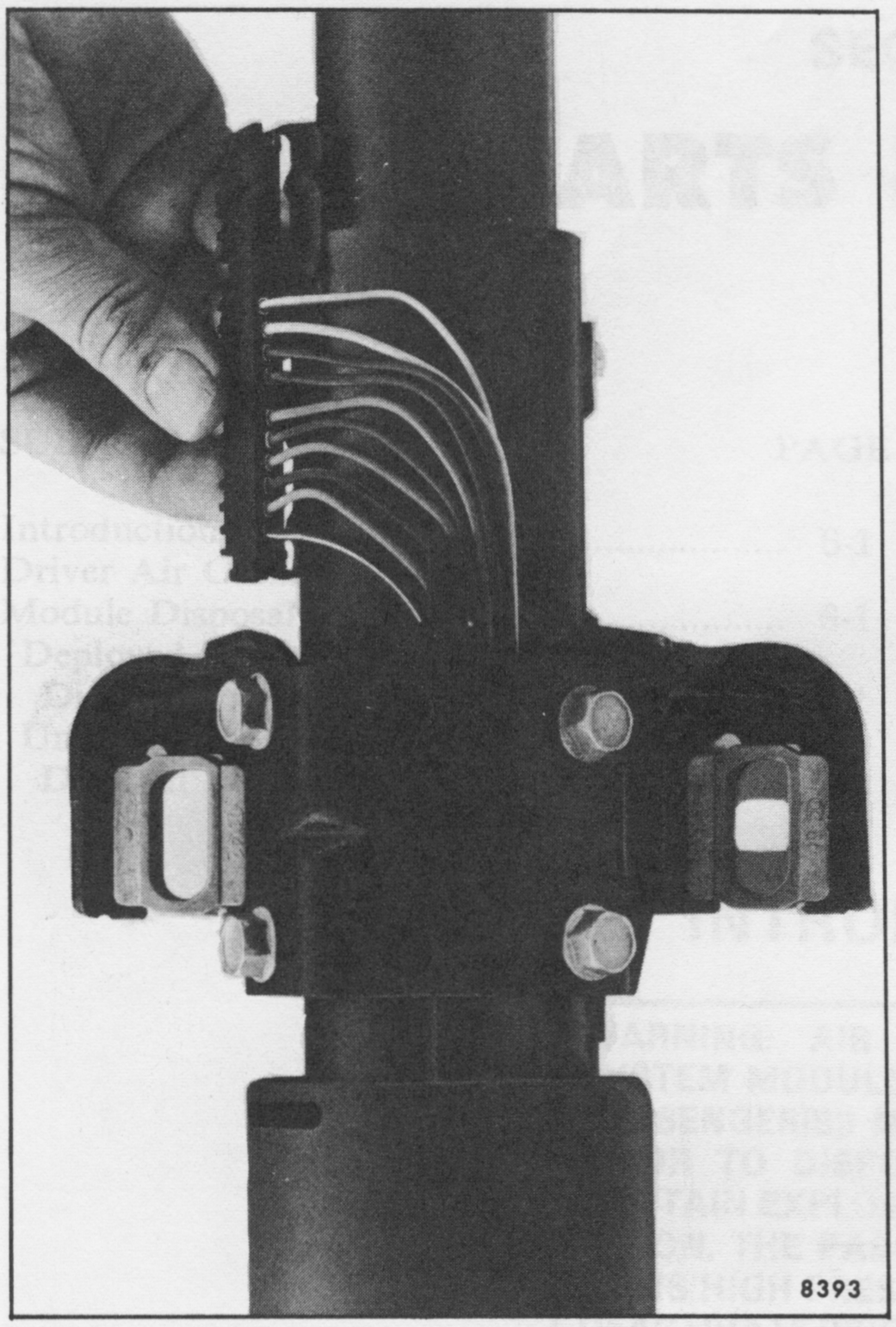

Fig. 5-55-Clipping Connector to Jacket Bracket

b. Put gearshift in "N".

c. Turn key toward "LOCK" and hold while installing switch.

d. Check if (A) gearshift moves freely from "P" to "L" (B) car starts in "P" and "N" but not "R", "D" or "L".

17. On all, assemble washer, spring and cancelling cam on shaft, making certain that the turn signal switch is in "NEUTRAL" and the hazard warning plunger is out. Assemble the lock plate on the shaft and using tool J-23131 or J-23653, depress these parts and install a new retaining ring in groove on shaft. The switch assembly may be damaged if the above procedure is not followed.

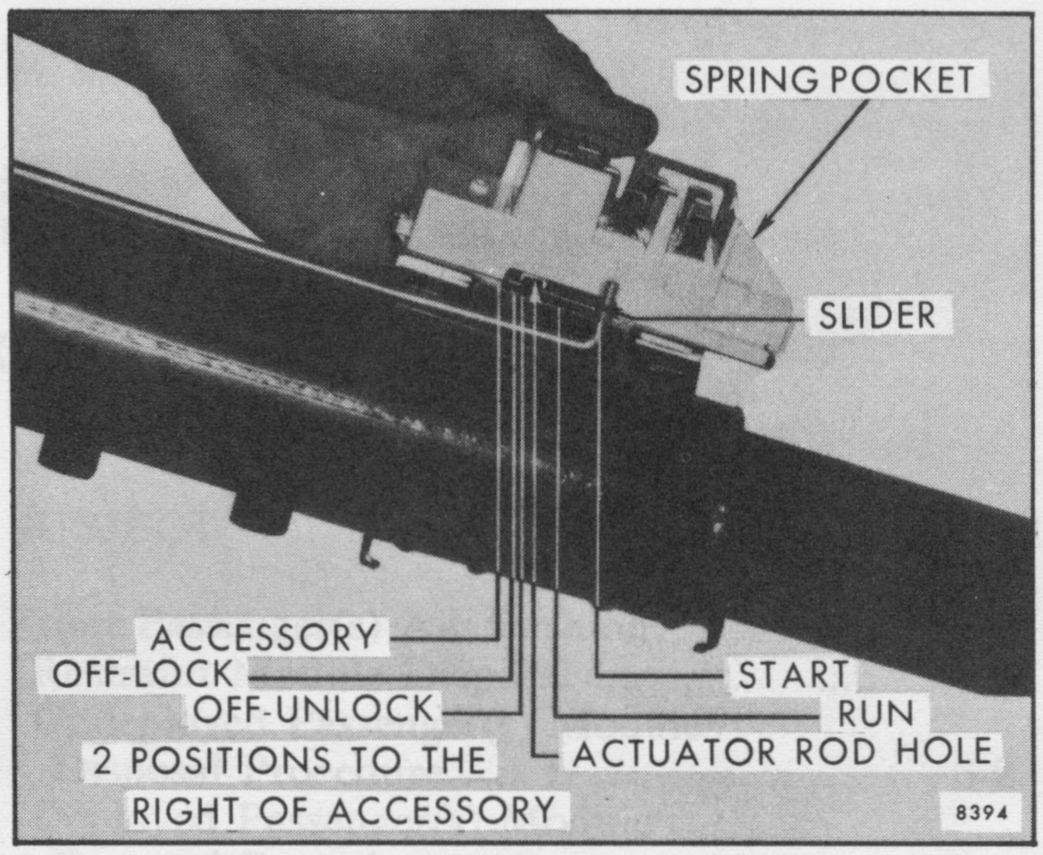

Fig. 5-56-Positioning Ignition Switch

18. Install slip ring. Make sure that it is seated firmly and plugged into Air Cushion Restraint System cable.

19. Place cover on shaft lock and drive screws (torque to 15 inch pounds).

20. Assemble levers onto column. Be sure bowl is in "DRIVE" when inserting shift lever.

21. Align locating tab on slip ring with slot in bowl and push slip ring into position. Make sure all three locking tabs are securely positioned.

22. Install cover and retainer, aligning cover over locating tab. Install screws and torque to 15 inch pounds.

23. With the alignment marks on the steering wheel hub and the steering shaft aligned, install the steering wheel and retainer nut. Torque nut to 35 foot pounds (Fig. 5-31).

NOTE: If module assembly is not horizontal, it will be necessary to adjust the tie rod ends until steering wheel assumes its proper position.

24. Install driver module. Refer to installation procedures.

SECTION 6

PARTS DISPOSAL

INDEX

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Undeployed Driver Module Disposal Procedure	6-2
Front Passenger(s) Air Cushion Restraint Module Disposal	6-2
Undeployed Passenger(s) Module Disposal Procedure	6-2
Deployed Passenger(s) Module Disposal Procedure	6-4

INTRODUCTION

WARNING: AIR CUSHION RESTRAINT SYSTEM MODULES (DRIVER AND FRONT PASSENGER(S)) MUST BE DEACTIVATED PRIOR TO DISPOSAL. BOTH MODULES CONTAIN EXPLOSIVE MATERIALS. IN ADDITION, THE PASSENGER MODULE CONTAINS HIGH PRESSURE GAS. FAILURE TO DEACTIVATE PRIOR TO DISPOSAL COULD RESULT IN PERSONAL INJURY.

DRIVER AIR CUSHION RESTRAINT MODULE DISPOSAL

INTRODUCTION

WARNING: DRIVER AIR CUSHION MODULE SHOULD ALWAYS BE CARRIED WITH VINYL COVER AWAY FROM ALL PARTS OF ONE'S BODY AND SHOULD ALWAYS BE LAID ON A FLAT SURFACE WITH VINYL SIDE UP. THIS IS NECESSARY SO THAT A FREE SPACE IS PROVIDED TO ALLOW THE AIR CUSHION TO EXPAND IN CASE OF ACCIDENTAL DEPLOYMENT. OTHERWISE, PERSONAL INJURY MAY RESULT.

DISPOSAL PROCEDURE (Removed From Car)

Deployed Module

When a deployed driver air cushion module (Fig. 6-1) has been removed from vehicle, as outlined in

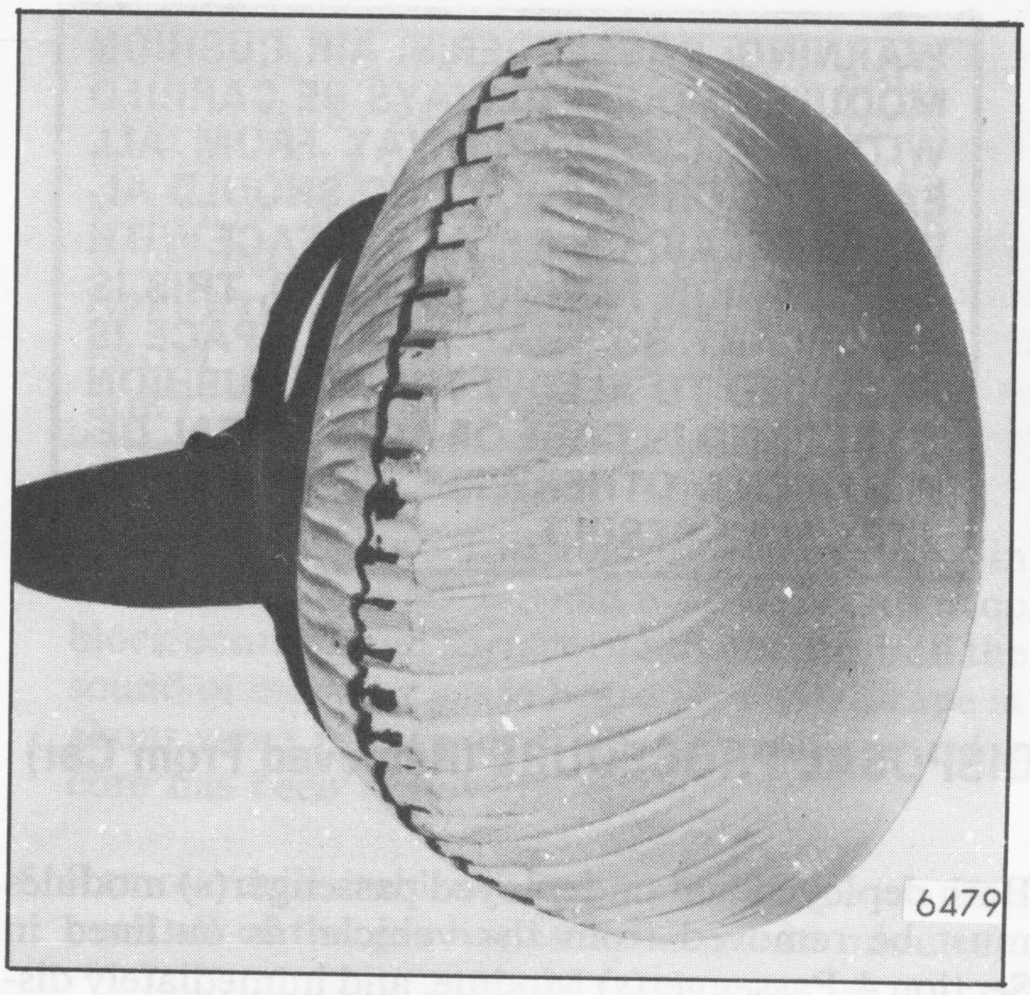


Fig. 6-1-Deployed Driver Module

Section 5-Driver Module and Steering Column, it can be disposed of in usual manner and discarded with any other scrap material.

Undeployed Module

In the event it becomes necessary to replace a damaged or defective driver module (Fig. 6-2) that has not been deployed, the following procedure will apply:

Immediately notify the local dealer and/or zone office. They will arrange for a representative to dispose of the module. If it is necessary to remove the module from the car before that time, it should be stored in a Air Cushion Restraint System shipping carton. The carton in which the replacement module is shipped is suitable for storage. If additional driver module shipping (storage) cartons are required, they are available under part number 1154146.

No attempt should be made to deploy or otherwise dispose of a undeployed driver module by any person other than an authorized representative.

When placing module to be disposed of in storage, the carton should be taped closed and stored on the floor with proper side up (as indicated on shipping carton).

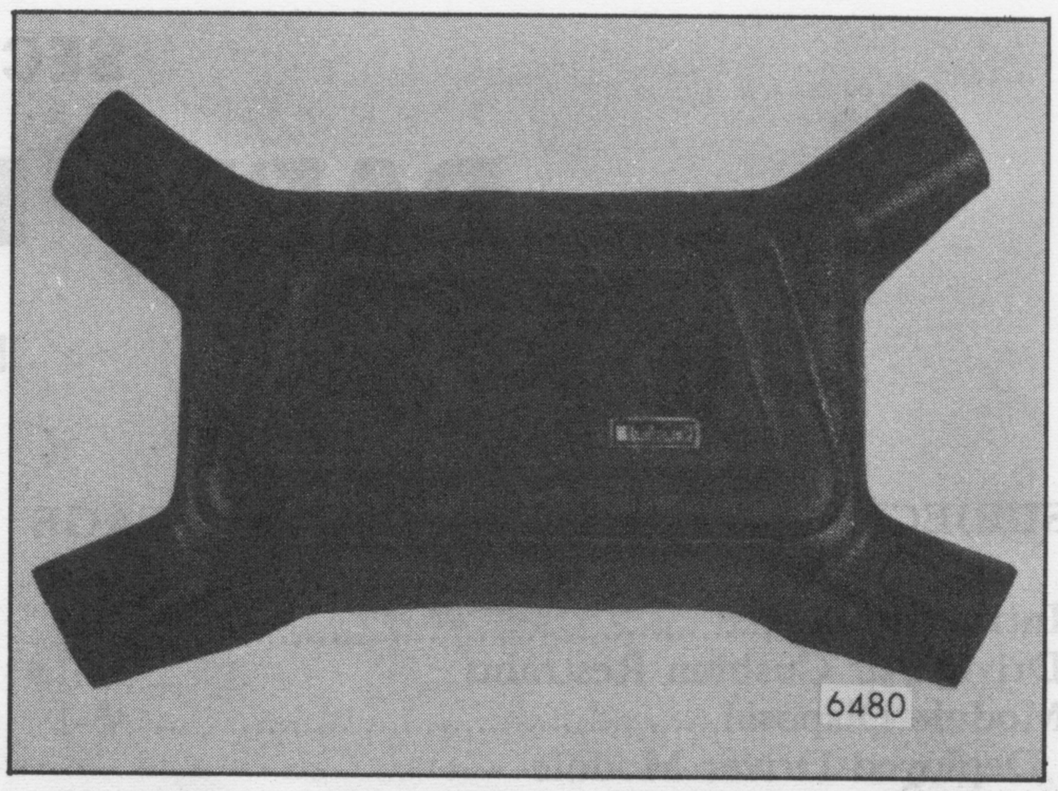


Fig. 6-2-Undeployed Driver Module

WARNING: DO NOT STACK CARTONS OR PLACE OBJECTS ON TOP OF CARTON. THIS WILL ALLOW THE AIR CUSHION TO EXPAND IN CASE OF ACCIDENTAL DEPLOYMENT. OTHERWISE, PERSONAL INJURY MAY RESULT.

FRONT PASSENGER(S) AIR CUSHION RESTRAINT MODULE DISPOSAL

INTRODUCTION

WARNING: PASSENGER(S) AIR CUSHION MODULE SHOULD ALWAYS BE CARRIED WITH AIR CUSHION AWAY FROM ALL PARTS OF ONE'S BODY AND SHOULD ALWAYS BE LAID ON A FLAT SURFACE WITH AIR CUSHION FACING UPWARD. THIS IS NECESSARY SO THAT A FREE SPACE IS PROVIDED TO ALLOW THE AIR CUSHION TO EXPAND IN CASE OF ACCIDENTAL DEPLOYMENT. OTHERWISE, PERSONAL INJURY MAY RESULT.

DISPOSAL PROCEDURE (Removed From Car)

Both deployed and undeployed passenger(s) modules must be removed from the vehicle, as outlined in Section 4-Passenger(s) Module, and immediately disposed of in the manner outlined below.

Undeployed Modules

In the event a passenger(s) module cannot be immediately disposed of, it must be stored in a Air Cushion Restraint System shipping carton in a secured area until the disposal procedure can be performed. The carton containing the replacement assembly is a suitable storage carton. If additional passenger(s) module shipping (storage) cartons are required, they are available under part number 1154147.

When placing module to be disposed of in storage, the carton should be taped closed and stored on the floor with the proper side up (as indicated on shipping carton).

WARNING: DO NOT STACK CARTONS OR PLACE OBJECTS ON TOP OF CARTON. THIS WILL ALLOW AIR CUSHION TO EXPAND IN CASE OF ACCIDENTAL DEPLOYMENT. OTHERWISE, PERSONAL INJURY MAY RESULT.

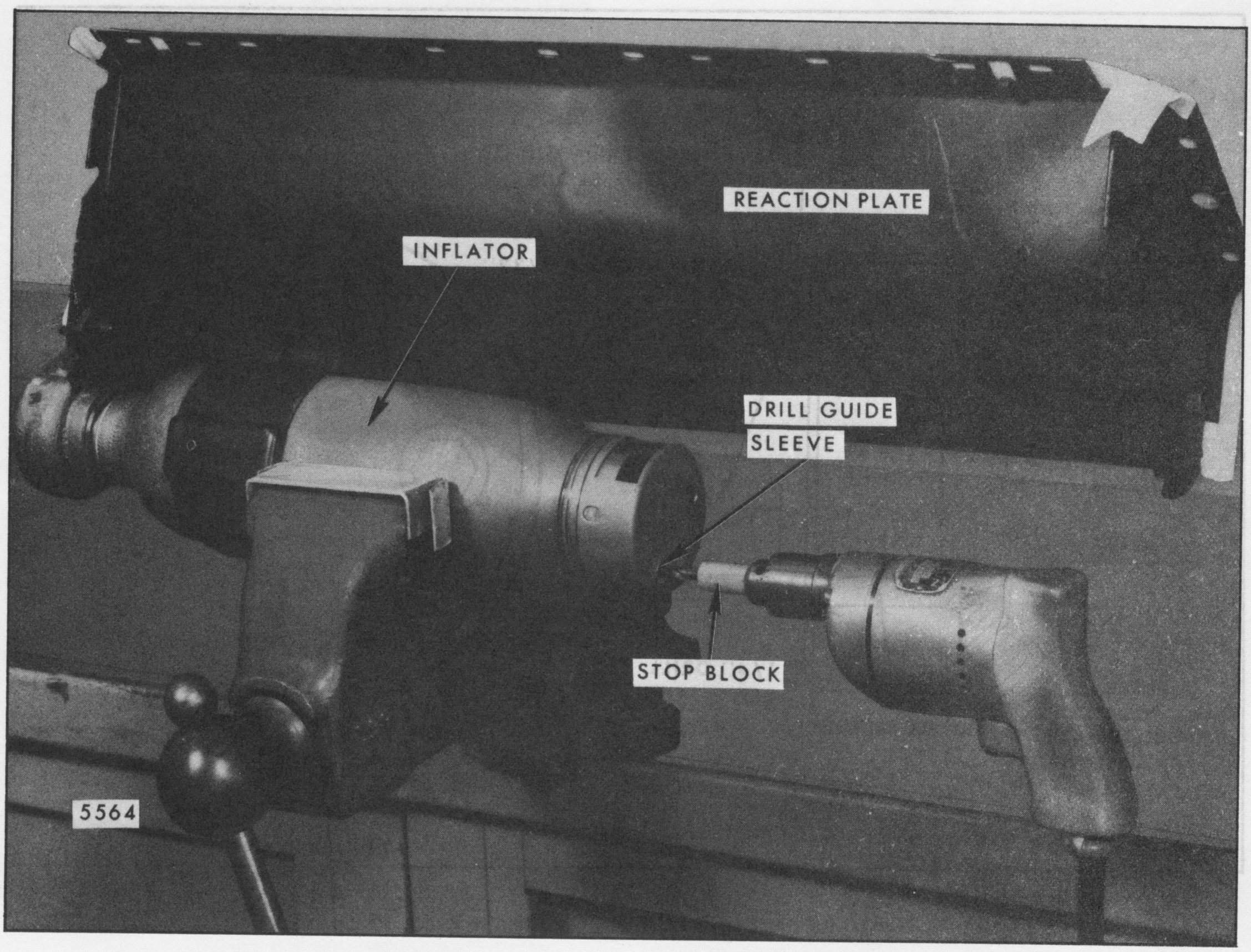


Fig. 6-3-Passenger(s) Inflator Disposal (Drilling Operation to Relieve Compressed Gas)

An undeployed module contains gas under pressure which must be released before disposal of the module is completed. In order to release this gas pressure the following steps should be taken:

1. Clamp inflator assembly in bench vise as shown in Figure 6-3.

2. Prepare wooden stop block to be used as spacer to limit depth of drill bit penetration into drill guide sleeve (Fig. 6-4).

3. Refer to Figure 6-4 and install stop block over a 1/4" drill bit. Then adjust bit in drill chuck until bit extends beyond stop block as follows:

   a. For Eaton or Allied Inflators 2-3/32".

   b. For Aero-Jet Inflators 1-3/32".

WARNING: SAFETY GLASSES OR A FACE SHIELD MUST BE WORN BY ANY PERSON IN THE AREA DURING THE DRILLING OPERATION AND WHILE THE PRESSURE IS BLEEDING DOWN AFTER THE DRILLING OPERATION. OTHERWISE, METAL CHIPS FROM DRILLING MAY CAUSE EYE INJURY.

4. Insert drill bit into drill guide sleeve provided in end of inflator (Figs. 6-3 and 6-4). Drill until stop block contacts end surface of inflator, or until the sound of escaping gas is heard (gas will escape at about same rate as air from a tire after a valve core has been removed).

5. Remove drill and leave assembly clamped in vise until all of the gas has escaped (12-18 minutes).

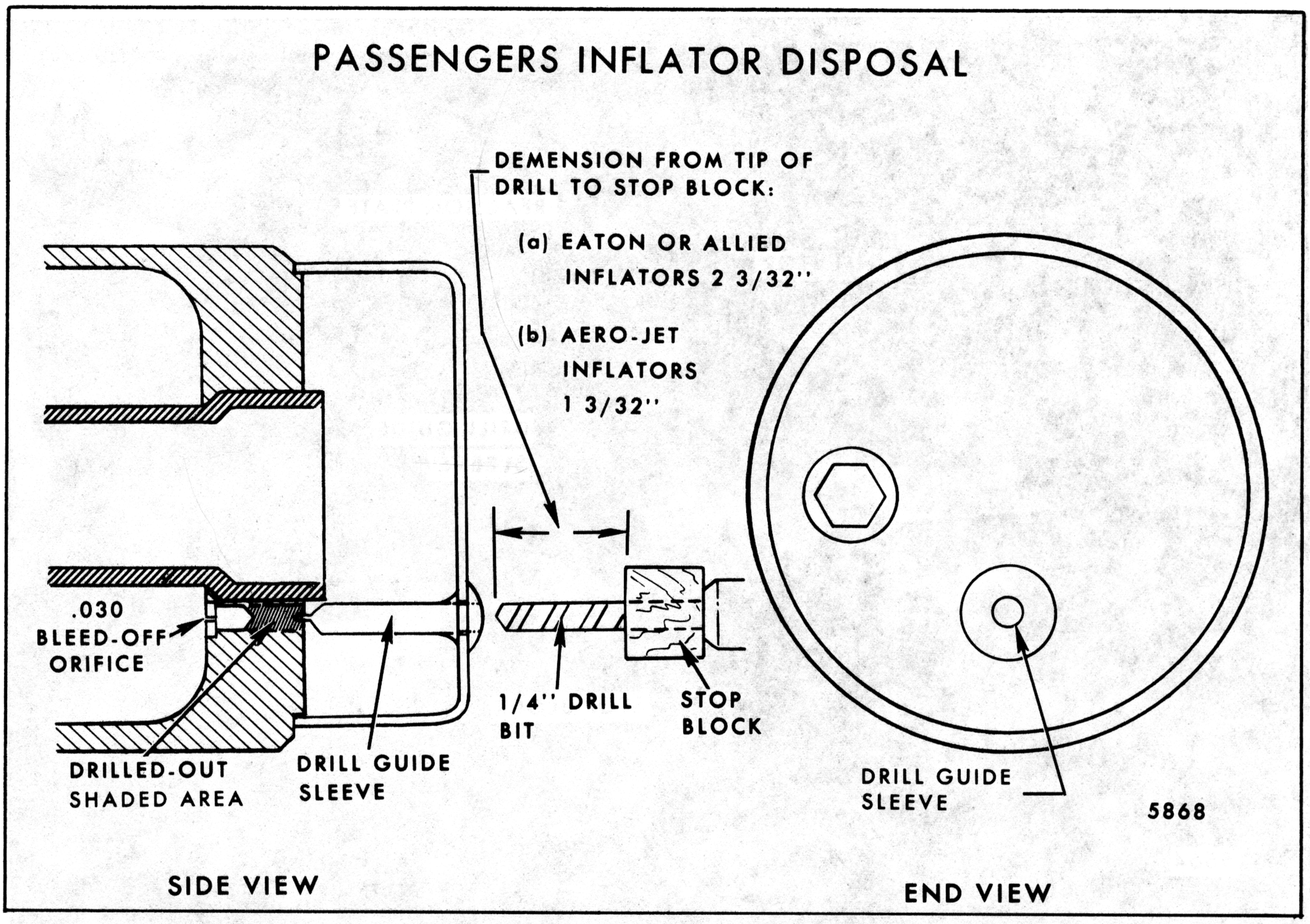


Fig. 6-4-Passenger(s) Inflator Disposal (Drilling Operation to Relieve Compressed Gas)

6. After gas pressure has escaped, proceed with instuctions applicable to deployed module.

Deployed Modules

The passenger module contains two gas generators, each capable of inflating the air cushion. One or both may have been activated in an accident. To assure that both gas generators are deactivated it is necessary to incinerate the module after the air cushion has deployed or after the gas in an undeployed module has been released as described in the "Undeployed Module" procedure above.

WARNING: DO NOT DISPOSE OF AN UNDEPLOYED MODULE WITHOUT FIRST RELEASING GAS PRESSURE. OTHERWISE PERSONAL INJURY MAY RESULT.

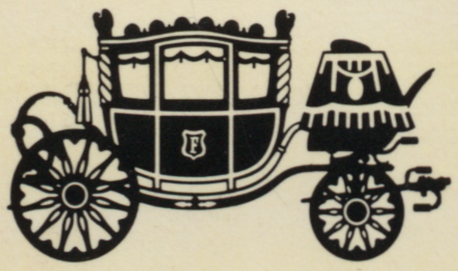
The following steps should be taken to incinerate the module:

1. Place the module with the air cushion side up in an open top 55 gallon drum.

WARNING: 55 GALLON DRUM USED FOR BURNING MUST BE PLACED IN AN OPEN AREA WHERE BURNING IS PERMISSIBLE. DRUM SHOULD BE LOCATED AT LEAST 15 TO 20 YARDS FROM BUILDINGS OR INFLAMMABLE MATERIAL BECAUSE BURNING DEBRIS MAY BE THROWN FROM THE DRUM.

2. Build a wood fire in drum which will create enough heat to activate module (Use of a wire mesh across top of drum is recommended). Module activation can be seen, but will not be violent. Fire will render the unit completely inactive.
3. After activation, module can be discarded in usual manner for any parts to be scrapped.

NOTE: If deactivation and disposal procedure outlined above cannot be performed due to local ordinances, or are otherwise impractical, contact appropriate General Motors dealer or local Zone Office Service Department for assistance.



Fisher Body

GM